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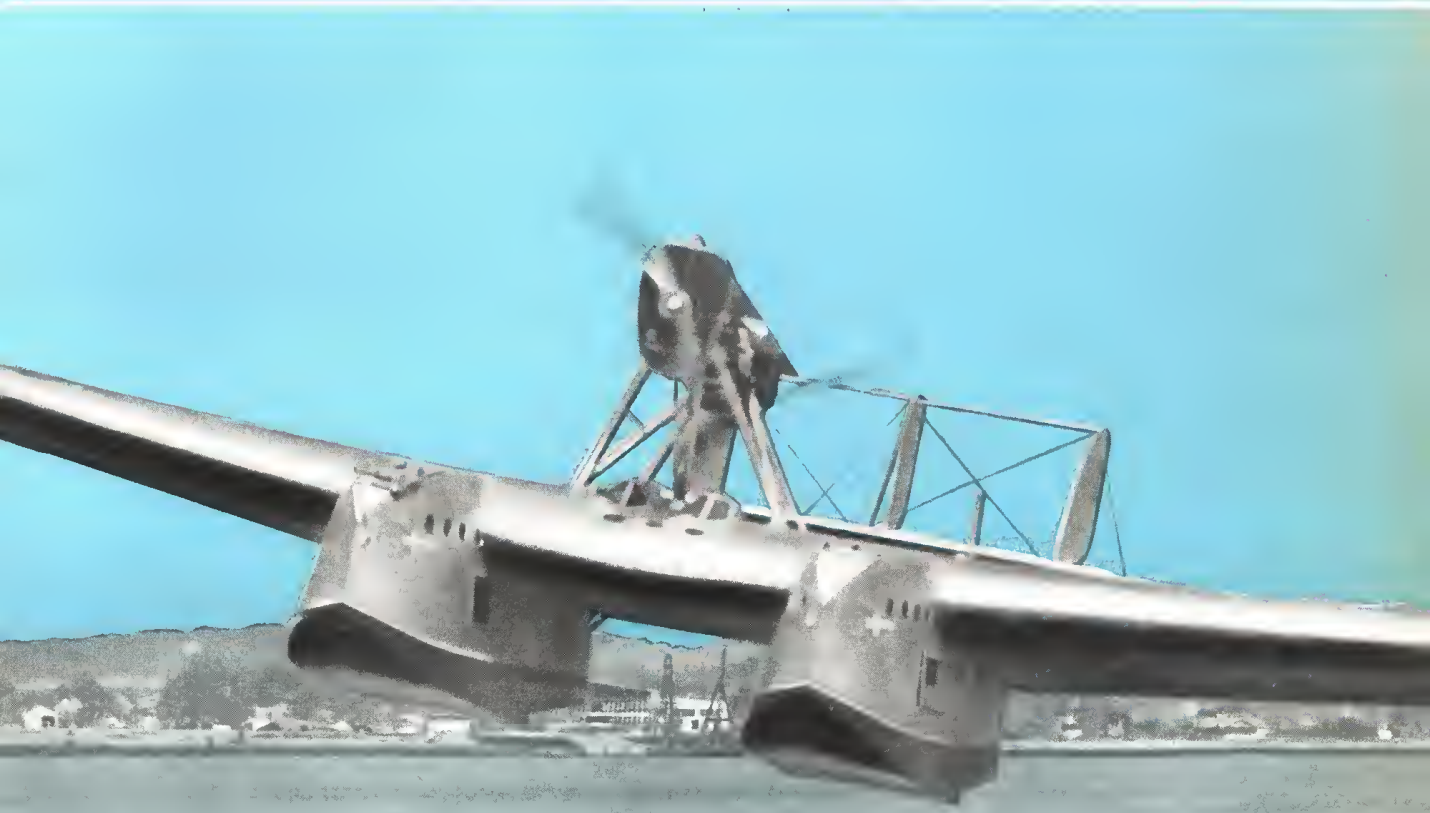
AVIATION

The Oldest American Aeronautical Magazine



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Powered with the Wright "Whirlwind Nine" (J-6) Engine. Cabin arrangement same as the CH 300. Easy access to cabin doors and cockpit from floats at both sides. Useful load, as Seaplane, 1,700 lbs. Pilot and payload, 1,205 lbs. Range with full payload, 5 hrs., or 550 miles at cruising speed. High speed, 130 m.p.h. Cruising speed, 110 m.p.h. Climb at sea level, 750 ft. per min. The floats used as standard equipment are made by Edo, their design is the result of years of experience, and they can be relied on for both serviceability and water performance. Complete specification, of either type plane, sent on request. Demonstration flights conveniently arranged.

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and

THE LIFE PRESERVER OF THE AIR

(Over 25,000 Happy Landings)

Paul J. Kaniut* left Kansas City at 12 A.M., March 22, 1929 with the Dallas overnight mail. Impossible weather forced him to jump at about five hundred feet up . . .

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If there are no dealers near you, write us and we will arrange the most convenient way to supply your needs.

*Mr. Kaniut is a member of the Caterpillar Club, organized in 1920, and confined in membership to those who have saved their lives by emergency jumps from planes in parachutes. The Club now has 252 members—all but ten of them made their jumps with Irvin Air Chutes.

The Irvin Air Chute is available in seat, lap or back types. They are all identical in construction with the exception that two grades of fine silk are used: one priced at $290, the other at $350. Every Irvin Chute regardless of price complies with the standard U. S. Government parachute specifications.

IRVING AIR CHUTE CO., Inc.
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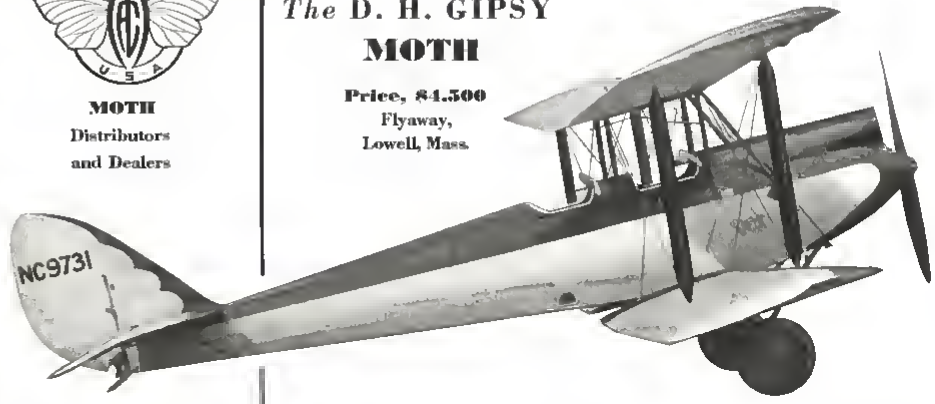

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NEW YORK has sold 150% of their initial order for Gipsy Moths since March 15; New England and Eastern New York State have sold 100% since February; Central Pennsylvania and Ohio and Michigan have sold over 35% since April.

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Even if you pay far more, we do not believe you can buy a better value than the Fairchild KR 34 And Fairchild KR 21 for sport and training purposes is a real pilots' ship, in power, controllability and ease of handling, at a price which gives it unequalled value.

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It was to supply public demand for an airplane uniquely designed to meet the exacting requirements of aerial photography that Fairchild began the general manufacture of airplanes, now built in plants at Farmingdale, L I , New York, Hagerstown, Maryland, and Longueil, P Q , Canada

The manufacture of special design pontoons and of skis is another Fairchild activity Fairchild is also a well known builder of boats Fairchild landing lights of a wholly new design are in great demand

This is, in brief, the present extent of Fairchild Aviation Corporation which, with $10,000,000 in resources, is one of the outstanding companies.

FAIRCHILD . . . MORE THAN THE NAME OF A PRODUCT

FAIRCHILD has great financial strength but it is not resources alone which give Fairchild leadership in the industry

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By that method, you can best determine how Fairchild KR engineers have eliminated unessentials in perfecting simple design and easily maintained construction.

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You can compare detailed specifications of equipment and finish with any other plane in its class, to the benefit of your investment in Fairchild KR.

The three-place **FAIRCHILD KR 34** *Wright 165 h p engine Gets off the ground quicker, climbs faster, shows more speed in the air than any other airplane using the same power plant and carrying an equal load.*

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FAIRCHILD

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The Oldest American Aeronautical Magazine

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EDWARD P. WARNER, *Editor*

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Air Mail Contracts and Rate Revision

THE ENACTMENT last year of legislation permitting the Post Office Department to give extended permits to the present contractors on air mail routes made it obvious that contract rates would be modified when extensions were considered. Only the most optimistic of operators dared to hope that that would be avoided. Any approximation of fairness among the contractors requires some adjustment in planning compensation for a long term of years, for at present absurd differences in the scales of payment exist. When payments to contractors depending almost entirely upon mail income to continue their operations range from less than thirty cents to over two dollars per airplane mile, the need for reconsideration is clear.

The lowering of postage rates on air mail made it inevitable, too, that the Post Office Department would seek to bring the income from air mail and the outgo on its account more nearly in balance. If that were not to be done the growth of the service would be retarded, and in the long run the interests of the aeronautical industry would definitely suffer, just as they have suffered in certain European countries from the existence and nature of subsidies. A service which is making headway towards carrying its own weight financially can expand without limit. One that remains a permanent burden on the taxpayer will be definitely held in check by the Treasury.

Complete self support must be the goal at the end of the air mail's road, and we must move steadily in that direction. The progress toward financial independence cannot, however, be pressed too rapidly. This government is fully justified in assuming a heavy expense in developing the air mail over the next few years, with the expectation that deficits now existing will be turned into profit within another five years at most. It is encouraging to note that there seems to be no dissent on that point and to observe the assurance in a despatch from Washington that the President, although he believes that the Post Office Department should be upon a paying basis and intends to put it there, is of the opinion that the air mail service should be carried through its poverty years without restriction on its natural growth and without radical financial surgery.

"The President feels," says the New York *Times*, "that the air mail service is in an experimental stage, and that losses now may eventually lead to gain. Moreover, he desires not only to encourage the upbuilding of plane mail service, but to aid the commercial expansion of aviation."

There can be general agreement that rate readjustment is an early and natural prospect. There can be general agreement that it should not be made too stringent in an endeavor to attain immediate conformity with some such arbitrary slogan as "Make the Air Mail Pay Its Own Way." Having agreed upon these points, there remain grounds for much argument upon the best means of arranging the readjustment.

WE ARE MOVED to some anxiety, which we hope will prove unjustified, by the recent action of the Post Office Department in requiring the adoption by contractors of a standard accounting method. That suggests too strongly the history of railroad rate regulation and the disposition to restrict earnings. The Transportation Act fixes for the railroads a standard "fair" percentage of profits, and confiscates a large proportion of any earnings beyond that figure. To apply the same process to air transport at this early stage of its development would be paralyzing to initiative and to efficiency. The percentage of profit made should have nothing to do with relative rates, which should depend upon only three factors—the average mail load, the distance that it has to be carried, and the inherent difficulties of the route and costliness of its administration. If rates are set in terms of those quantities and those alone, operators who do their work well and efficiently will profit accordingly

and will be able to expand. Those who run their lines badly will lose ground and give way, and that is as it should be. The business of carrying air mail is not immune from the practices of competition, even though there is but a single contract on each route. Those who can keep their cost per ton-mile and airplane-mile low are entitled to a liberal award. Those who fail to do so must expect to suffer. It is earnestly to be hoped that in the rearrangement of rates no penalty will be laid upon the contractors whose accounts reveal them already to have obtained an exceptional degree of economy and efficiency of operation.

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Spinning in Schools

IT GOES WITHOUT SAYING that no pilot can be considered as properly instructed, and certainly none should receive any sort of license, until he knows what a spin is and how to get out of it. His acquaintance with the subject should not be gained from books. It should not be based solely on precept. The knowledge should be made a part of the student's very being, and only practical experience while under the care of his instructor will make it so.

Many modern airplanes are hard to spin, and the danger of falling into a spin unintentionally is correspondingly slight. The number which absolutely and literally cannot be spun under any load condition is, however, exceeding small. Until it becomes much larger every pilot will need spinning instruction.

There are various ways of giving it. Perhaps the most usual procedure among instructors is to go to a safe height, stall the plane abruptly, kick on full rudder, keep the stick back and go into a fast spin, recovering normally after a few turns. The student then may, and certainly should, be required to repeat the maneuver for himself.

ALL VERY WELL so far as it goes, but it leaves the pupil with the impression that a spin is an acrobatic maneuver to be entered into only by violent manipulation of the controls. It gives him no realization of the way in which a plane may slip into a spin from a stalled turn. Some young pilots who never acquire that knowledge gradually become careless about avoiding the stalled attitude and finally get into serious difficulties.

Schools should seek to instruct their students not only on how to get out of a spin, but also on the conditions under which one may unexpectedly occur, especially on planes badly designed, or badly rigged, or with the load improperly distributed. The lesson can be made most graphic if the instructor, having attained a sufficient height for safety, simulates by the use of throttle and controls such conditions as those of engine failure while getting out of a field, and then flies the plane just badly enough to produce a spin without moving the control so abnormally that the errors are obvious to a novice. If the pilot in course of training can once see a plane drop into a spin without his having previously realized that anything was wrong, he will be left with a healthy sense of the importance of maintaining flying speed which will save him much trouble later.

Many present-day planes are so controllable and stable near a stalled attitude that it would hardly be possible to start them spinning by any reasonable operation of the controls. There are other types, however, which are notoriously easy to start spinning and easy to bring out quickly, therefore being safe in skilled hands. A school which aims to give the very best and most complete and safest possible instruction to students may well find it worth while to keep a certain amount of such equipment for the sole purpose of dual control spinning instruction.

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The Aeronautics Branch Acquires Another Asset

THE AMERICAN AIRCRAFT INDUSTRY has been very fortunate in the quality of the men who have headed the aeronautical work of the Department of Commerce since it was started three years ago, and equally fortunate in the caliber of those whom they have found to be their principal assistants. Secretary MacCracken and Director Clarence Young have displayed rare skill in estimating the capacities of their aides, and they have been patient in their search for the ideal combination of qualities for each post. The adroitness with which their choices have in general been made is again displayed in the selection of Kenneth M. Lane to head the Engineering Section of the Aeronautics Branch.

The post is no sinecure. It makes varied demands. It requires, for the perfect performance of its duties, training and experience which few men possess. Fewer still combine with the necessary qualifications the willingness to assume duties so harassing.

The Chief of the Engineering Section should know design theory with unquestioned thoroughness, and especially structural theory, for disputes over the calculation of the strength of airplane structures are among the major burdens of his office. Lane, having previously been a teacher of general structural theory, specialized for five years in its application to airplane design at McCook Field. The chief of the section should have a thorough command of the practical problems of design and of the working methods of the designer. Mr. Lane's distinguished career as a designer culminated in the taking of a leading part in the development of the Wright Apache, for more than a year the holder of two world's altitude records. The head of the section should know how to interpret specifications, how to distinguish between grave violations and venial ones, when to be strict and literal and when to be lenient. Mr. Lane worked with the Engineering Division of the Army Air Service all through its formative period, when design specifications were in the making and but little understood, and when a mere hard-boiled insistence upon the letter of the law, neglecting its spirit, would have brought about chaos. Having seen specifications from the point of view of the man who enforced them, he crossed over to the industry and took the other side of the argument, that of the engineer trying to accomplish his purpose without too much restriction.

The position needs all that, but it demands yet more. Beyond everything else, the man who holds it successfully must have character. He must command confidence. He must possess the happy blend of determination and tolerance. We are not in the confidence of the Aeronautics Branch, but we are safe in saying that its officials felt assured of finding all that and more in Kenneth Lane. We feel assured that time will prove that they were right.

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The Air Mail Crosses the Equator

THE GREATEST EVENTS are not likely to fare best with publicity. The announcement of one of the most significant aeronautical happenings of recent years has been hidden away on the inside pages of daily papers, or has failed to claim their attention at all. The longest airline in the world has gone into full operation within the past two weeks. Airplanes under the flag of the United States now render regular service all the way from Florida through Central America down the west coast of the Southern Continent to Chile, a distance of nearly six thousand miles. For the first time American commercial airplanes have "crossed the line" but we fear that King Neptune and his court, baffled by too much speed and altitude, failed to come aboard the Pan American planes in accordance with the traditional marine practice.

With the opening of this ambitious undertaking of Pan American-Grace Airways, backed by the Post Office Department and made possible only by the enthusiastic co-operation of our neighbors all the way down from the Rio Grande to the Straits of Magellan, Pan-American relations enter a new phase. Regular commercial transport now links the Canal Zone and Chile in scarcely more time than was required to travel from Southern Florida to Seattle three years ago. The best time of any means of transport previously in existence has been approximately halved. A copy of one of the daily papers of Buenos Aires dated July 21 is being delivered in New York exactly nine days thereafter.

THE AIRPLANE CREATES a new Pan-American community. No longer need Buenos Aires and Lima seem remote parts of another world to those who have never visited them. We shall receive letters from our friends who have gone to associate themselves with South Americans in the development of local resources and industry, while the news that the letters contain is still fresh. The South American press will receive full interpretation of events in the United States before they have become unattractively stale and without having to carry the burden of bankrupting cable tolls which has restricted their correspondents to communications of skeleton dimensions in the past. American travelers will learn something of the charms of the lands which lie beyond Panama, and will perhaps begin to visit the Latin civilizations of Santiago de Chile and Rio de Janiero, instead of knowing at first hand only those of Paris and Rome.

In the prospect of improved communication, and the consequently improved understanding between our own people and those of the countries to the south, there is a bright omen for enlarged American participation in the industrial and commercial expansion of the Southern Continent.

Industrial expansion will call very soon for more and better transportation, and that will mean airlines, for which the natural attractions in large parts of South America, now without adequate transport of any kind, can hardly be excelled. The first airline in the world to run at a profit without direct governmental subsidy was on South American territory. There will be need for many more air lines there in the future, and our aeronautical industry should be alive to every opportunity to aid in their establishment. A splendid beginning is being made with the air mail connections opened in the last few months. The President has shown himself enormously interested in promoting further progress. He follows a trail started by his predecessor. When President Coolidge, in one of his annual messages to Congress, indicated that he considered the question of inter-American airlines to be of such special importance that he had directed the appointment of a special inter-departmental committee to deal with it, the remark received relatively little attention in the press. In years to come, however, the work then started at the President's instigation and that was carried on by the committee comprising the three Assistant Secretaries of Aeronautics and representatives of other departments interested, and that finally led to the passage of the foreign air mail law, and so on to the opening of the Pan American airline system, may well appear among the most important and historic acts of the administration.

Marketing THE LIGHT COMMERCIAL AIRPLANE

By JACK W. DUELKS
Sales Manager American Aircraft Co p

BECAUSE OF its record of almost 100 Waco biplanes sold during 1928 the American Aircraft Corporation has been called the world's largest distributor of commercial aircraft. Whether or not we have any right to this title it is true that with its large and active territory (California, Arizona, New Mexico, Utah Nevada, and the Republic of Mexico), the American Aircraft Corporation, through its own efforts and the work of its dealers, has been able to sell a great many airplanes and in so doing has learned many things about the marketing of commercial aircraft That intelligent marketing pays is best illustrated by our record so far during 1929 of having doubled Waco sales in our territory over the corresponding period of last year

We believe that a correct distributor-dealer plan must be the basis of any successful marketing method and have worked out an arrangement which seems to be ideal American Aircraft dealers of which there are now nine, are given exclusive rights in their own towns only and all other territory is kept open to any other dealer or to ourselves This plan tends to keep the dealers at home where they can do the most good instead of influencing them to arbitrarily make a sales effort throughout a large closed territory, just because they have been granted that territory By eliminating closed dealer territories we do away with many disagreements which they inspire, and because we do not need to arbitrate any grievances among our dealers we can more easily keep the friendship and loyalty of them all Often there are reasons why one dealer can best sell a party who may be nearest to some other dealer Friendship, business contacts chance opportunities, may bring good leads which would go unsold if each dealer was restricted to a set territory

A Sport-Wing Waco at the top of a loop

For the systematic coverage of a large territory we have found that the distributor can best make the required tours of small towns and back country, doing in one well organized tour what might otherwise be expected of several different dealers, each working independently Such a procedure permits the dealers to confine their activities to the rich opportunities close at hand, while the distributor, in turn, has a large open territory which may be worked without conflict with the various dealers Thus open territory plan puts every dealer on his toes lest some other dealer or the distributor himself should come into his vicinity and sell a good prospect Of course, if too many sales are lost by any one dealer a new dealer is appointed, and this practice has helped to give us a wide awake group of dealer representatives

In return for the privilege of making sales in any portion of the open territory we go into the dealer's home town and make demonstrations, or close difficult sales, without loss of commission on his part, such assistance usually being rendered in connection with our regular sales tours

Such a sales plan means that the distributor's sales manager must be constantly on the go, conducting regular flying sales trips into every portion of the territory When we appoint a new dealer he receives frequent visits from us but as the dealers become better established we send a sales promotion man to visit each dealer at least once every thirty days In conducting these monthly distributor tours we have the opportunity of doing something which has long been an axiom of all selling effort that is, "to put our best foot forward," or to put up the best "front" to the buying public that our merchandise merits This is not done by overstatement, lurid claims, or flashy advertising, but because the distributor has a much larger organization than the dealer can have, he is able to send the best planes, the best salesmen, and the best mechanics out to contact the trade Demonstrator planes are thus always new and in the best of condition, demonstrating pilots have normally no other duties but demonstration flying and they learn many tricks and methods of demonstrating not practised by men not especially trained to demonstrate planes, and the sales manager who conducts the tour can leave all details of flying and servicing to the pilot and mechanic while he gives his undivided attention to the selling problems, with which, as a sales manager, he should be more familiar than any member of the dealer organization

Another way in which we make the best possible impression in each town visited is to write a letter to the president of the local Chamber of Commerce some time in advance of the visit, giving the exact day and hour at which to expect the plane's arrival at the local field Especially, if we wish to appoint a dealer in the town it is possible to arouse much favorable interest among the local business men through such a Chamber of Commerce letter In any case we find that it is better to direct a signed message to the men who may be interested in buying a plane than to send a general story to the local newspaper which may result in a large and troublesome crowd at the airport. Crowds are a direct hindrance to sales, annoy the prospects, the salesman, and the pilot, and in many cases submerge the prospects completely so that it is impossible for us to pick out the men toward whom our sales effort should be directed Quite often the local wiseacres who may know nothing whatever of the construction of an airplane will walk around and thump on the fabric, tug at the wires and struts, and make disparaging remarks about the plane in order to appear as an expert to those who know even less about aircraft Of course, if the crowd has been assembled by some local group, as is the case on organized air tours or special field dedication days, etc , it is generally more orderly and a favorable impression is more easily made

DURING two recent sales tours which we have conducted a rigid schedule has been set in advance which has then been rigidly adhered to With Allan A Barrie as pilot, flying one of our new Waco 220-T tapered wing planes with the J 5 Whirlwind engine, I found it possible to cover all of California between May 6 and 15, visiting a total of 27 towns and flying approximately 2,500 mi. in the 10-day period with 11 direct sales as a result of the trip From June 1 to 9 we made a tour of central California with the same pilot and plane, flying with the 1929 California Air Tour, visiting seven large towns in central northern California, participating in races, contests, and passenger carrying at each town, and selling six planes in the 10 days in spite of the fact that our primary purpose in accompanying the tour was to stimulate and educate those interested in aviation rather than to conduct an organized sales campaign

When we are on a planned sales tour a definite method of approach is followed at each stop Our letter to the Chamber of Commerce almost always gives us a good group of live prospects waiting at the field for our arrival, and if they are not already there a few phone calls following up our letter, always give us good leads

After the necessary introductions we follow the plan of having the pilot take the plane up without passengers and put it through its paces as the salesman makes his talk to the prospects A definite plan is followed in this demonstration flight The plane which we use is the tapered wing Waco and we demonstrate to the best advantage the violent maneuvers of which it is capable This demonstration surpasses considerably what we could show by flying one of the lower powered commercial models, thus vividly showing the purchaser what sort of performance he may expect from our planes

FOLLOWING the prearranged plan the pilot makes a quick take-off, shows the plane's fast climb, and then comes across the field at minimum flying speed to show how slowly the plane floats and how easily it maneuvers at slow speed After gaining altitude a slow loop and a slow roll are performed in succession to show how easily these acrobatics can be done and how positive the controls are in all positions The most impressive part of the Tapered-wing demonstration is inverted flight and climbing while in inverted flight, this stunt always causing much comment While the prospect may never have occasion to perform these maneuvers we find that he gains confidence in the factory and all of its products when he knows that it produces a plane capable of such performance At the conclusion of this solo demonstration as slow a landing is made as the conditions safely permit and particular care is taken to taxi smoothly while on the ground Although this demonstration is impressive we make no attempt to appear spectacular, or to show off unnecessarily, trying always to give the impression that the flight is a matter of easy routine During the time that these maneuvers are being performed in the air by the pilot the salesman on the ground is carrying on his talk in tune with the demonstration, calling attention in a natural way to the various important flight qualities shown Then when the plane is on the ground with the demonstration fresh in mind the salesman points out the beauty of line and finish and the sturdy and practical construction of the plane, seeking always to generate in the prospect the pride of ownership which will make him desire the plane as a personal possession as well as a business asset

Immediately after the solo demonstration each of the prospects is sent up for a short, smooth ride, the attempt being to inspire confidence in the steadiness and safety of the plane

At this stage of the sales procedure it is important to

find out the particular phase of aviation in which each prospect is interested There are many models of Waco planes and we find it possible to make many sales by switching interest from the desirability of planes in general to a consideration of what particular model would best suit the prospect's needs In no case do we seek too high pressure through the sale of some particular model plane and if we cannot sell the plane which we feel is required we prefer to lose the sale rather than to load the prospect up with a plane with which he will later become dissatisfied Here we are helped materially by the fact that each Waco plane is built for some particular engine and each plane offered for sale by us will come through from the factory with a "C" license granted by the Department of Commerce These factors mean much to a sale for we can show that our line of planes has been specialized to meet a wide range of needs and that each special model has been certified by government inspectors

We find it always best, after the demonstration, to lead the prospects away from the plane and from the field, to as quiet and secluded a spot as may be found for our final sales talk It is much easier to discuss financing and insurance in a closed office over a desk or table than while standing out by the plane fingering struts and wires and being annoyed by the general confusion, the dust and propeller blast of other planes Incidentally, it seems that financing the purchase is in all cases the most difficult problem to solve, and the man who is best prepared with a good time payment plan is most likely to make difficult sales Of course, when selling on a time basis we carefully investigate the prospect's credit standing and do not expect the finance company to accept a contract unless we are sure that it is safe However after more than a year of time selling we have had only one repossession the subsequent resale of which saved us from any loss

Where we find that a prospect cannot be sold at once we turn him over to the nearest dealer, or perhaps call back later if our trip can be so arranged Another point which we are finding of increasing importance is the follow up after a sale and we now consider a transaction as just commenced when we have the buyer's money We keep a careful record in the Los Angeles office of the American Aircraft Corporation of all purchasers of our products Two weeks after a sale we send out a letter to make sure that everything has been as we represented and to remind plane owners of the service facilities which we maintain At the end of 30 days we inspect the plane, and if necessary re-rig it without cost to the purchaser Once each month thereafter we send out a letter containing news of the latest models asking for the names of good prospects and in general seeking to keep the buyer contented and through him to make additional sales Just as it is true of automobiles so it has proved true to an even greater degree of airplanes that a new owner is excessively proud of his purchase and exhibits it to everyone, telling them of its merits and of the good judgment which he has shown in making the buy We try to capitalize this valuable condition by using the famous phrase, "ask the man who owns one," and believe that such a practise is having more influence on the sales of aircraft than it has ever had on the sales of automobiles

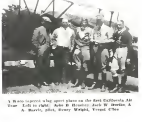
Many of our leads of course, come direct from the factory as a result of its national advertising All inquiries from prospects in our territory are sent to us direct and we in turn send to the various dealers any inquiries which may originate in their home towns All inquiries from open territory are handled by us, on the regular sales tour if possible

Just as the development of time payment plans has been the result of volume sales so we have found that a large sales volume soon results in a used plane problem We have worked out several ways of handling used planes but we believe the most important factor to be our attitude, when selling each used plane, of looking to the purchaser of that plane as a probable buyer in the near future, of a new plane Thus on used plane sales we seek large sales volume with a low unit profit, and at the same time make each used plane sale such an honest transaction that we expect to do repeat business with the customer

Another way in which we boost used plane sales is to run advertisements in the newspapers emphasizing the economy of buying a used plane to pile up time in Also we sell some of our demonstrators at a considerable saving to the purchaser who is usually a student pilot seeking to gain the experience necessary for a transport pilot's license.

Whenever the owner of a used plane plans to purchase a new model we take his old plane in on consignment and sell it for him the sale price then being taken as a deposit on the new machine In such a transaction there is no charge for making the sale Always when selling a plane we seek to come to an exact understanding and prefer to lose the sale rather than to misrepresent the plane and have the buyer become dissatisfied later We lay bare the record of each used plane at the time of sale find out and tell the prospect whether it has ever been "cracked" or damaged, and also recommend any needed repairs or reconditioning such as new fittings, engine overhaul, a covering job or a new paint job Such frankness in handling used plane sales does not rush them through in a hurry, but when planes are once sold by this method they stay sold and we have not only sold the new owner on his plane but also on our establishment as a good place to do business

Although we have handled many used planes we do not touch a deal where the plane is not licensed by the



A Waco tapered wing sport plane on the first California Air Tour Left to right John B Henchey Jack W Duelka A A Barrie, pilot, Dewey Wright, Vergel Cline

Fresno Airport during the first California Air Tour

Department of Commerce Such methods emphasize the repeat sale angle, and this phase of selling has proved of the utmost importance to us for the successful operator of one plane usually soon expands his operations until he needs a fleet of many planes.

One thing we do in connection with new sales, which may be new to aircraft selling, is to refund the railroad fare to any out of town prospect who comes to our Los Angeles headquarters and buys a new plane Although this practise cuts down our commission on such sales we believe that the customer who comes to us instead of being sought out by our salesmen, deserves consideration

There has been much talk of popular sales to the average American family man, but we have carefully listed our richest sales sources of the present time and find them to rate in the following order; the dealer the flying student, the successful business man, and the wealthy sportsman This, of course is considering the popular type of airplane and not the craft being put to airline and transport uses Although at first glance it does not seem fair to include the dealers as prospective purchasers except that we receive a commission on each plane sold by them, we have found the dealers to be the heaviest users of light planes because of the schools and scenic or short hop services which they maintain in addition to their work as airplane dealers Therefore we seek to help them apply their planes to new uses, we help them build up their passenger traffic and school enrollment thus creating a demand for many more of our planes as used by the dealers themselves One thing upon which we insist for the sake of the airplane's reputation, is that all students in our dealer's flying schools must be given at least 10 hr of dual instruction before being permitted to make a solo flight This rule saves much minor damage which is the result of permitting students to solo too early We feel that any sort of a crash, even though it is simply a bad landing which snaps the shock cord or blows out a tire, gives our plane a bad reputation to the spectators who probably do not know that an inexperienced student is making his first feeble attempt to fly, and we are therefore particularly strict in enforcing the 10 hr. dual instruction rule

With regard to student sales it has been our observation that in the majority of cases a student's first plane will be of the same type as that in which he learned to fly We feel that it is more important for the dealer to carefully nurse his students along to the point where they become plane owners, than it is to build up a large student roster

Although a poor third in present importance the successful business man will probably soon rank first as a light plane buyer Of course many business men may be included in the student sales group, but the majority of business men now buying planes either hire a pilot to fly for them or else learn to fly after the purchase The average successful business man is a success because he took advantage of some new development or new opportunity, and for this reason he is now seriously turning to the new business of aviation as a legitimate field of activity and source of future prosperity We have made sales in places where there was not the slightest encouragement at the outset and no apparent interest in any phase of aviation, and have come to the conclusion that if a man is a success, regardless of his race, age or general mode of life, he is a good prospect for an airplane

Of course many wealthy people of both sexes will continue to buy planes for sporting uses alone Perhaps we should empasize this field for the present, from a purely selfish angle, because it is a comparatively rich source of easy sales

However, selling planes to people who will use them for sport and pleasure alone is not following the guiding star of the aviation industry Such sales will continue in fair volume for a while and should be sought after, but the saturation point is soon reached on any product which does not have the practical utility appeal which generates volume sales There are many pleasure yachts sold each year but there is a vastly greater number of electric refrigerators being sold

The airplane is primarily a tool of commerce and industry and we believe that our business of selling airplanes must be built from the ground up on a solid foundation of commercial application, and that the big sales volume of the near future will be attained by selling planes to individuals or organizations who can make a profit by operating them

THE Los Angeles METROPOLITAN AIRPORT

By CHARLES F. McREYNOLDS

The administration building at the Metropolitan Airport. Note the revolving beacon surmounting the control tower

ALTHOUGH the United States Department of Commerce has been able to promulgate a well thought out set of requirements for approved type airports, no one is sure of what the airport of the near future will be like, and there is still considerable difference of opinion on what sort of airports are required by conditions at the present time. One thing, however, is certain, and that is that each airport must be developed for some definite phase of flying activity.

Just as there are differing sorts of airports, there must be different plans for development and operation of airports which will vary according to the parties behind the projects. Many sorts of municipal schemes, not all of them successful, have been tried and there are a few examples of private enterprise seeking to develop airports.

The Los Angeles Metropolitan Airport represents the effort of a private enterprise which was not primarily an aeronautic group. Original in conception, the plan by which this airport has been developed seems to offer real possibilities for duplication in many large cities of the country. Behind the building of Los Angeles Metropolitan Airport is a real estate company which had a large parcel of land that it wanted to sell. In order to sell the land it conceived the idea of developing a gigantic airport project. This required a large amount of money but the land syndicate was willing to invest money in the airport improvements in return for the profit to be obtained from the sale of sites on the airport to commercial and private operators, and of homesites off the airport to the families drawn to the vicinity by the factories which it was planned to erect. A plan was laid out which called for the expenditure of approximately $2,000,000 in airport improvements over a period of two years time, the plan being to start improvement work at once and gamble on the sales of land to pay back the cost of land and improvements, with a profit.

Since the real estate syndicate had no wish to enter the business of airport operation the plan provided that after a two-year period all business of the airport would be conducted by the owners of property thereon, each of whom, at the time of purchase automatically received shares proportional to the size of his purchase in a holding company which would conduct the affairs of the field when the original developers stepped out of the picture. This scheme is precisely the same as that used in any new real estate subdivision where sales of land are made to pay for streets, sidewalks, street lights etc., and where the water is provided by a company set up by the original developers and eventually turned over to the lot owners. In the case of the airport, the runway system takes the place of the waterworks system, and it is hoped to save site purchasers the cost of maintaining the runways after the two-year period by deeding all streets and runways on the airport to the city of Los Angeles. This plan would call for maintenance of such runways by the city street department and would at the same time insure the permanence of the runways for as long as their use might be required.

DURING the two-year period all operating and maintenance costs are being borne by the developing syndicate and no landing fee of any sort will be charged so long as the original developers still control the property. If it is found impossible to negotiate an arrangement with the city providing for perpetual care of the runways, a landing fee of 50c. will be charged for all landings made by transient planes, after the two-year development period. It has been estimated that 40,000 landings per year at 50c each, would pay the cost of operating and maintaining the airport. Since transient landings for the month of June were at the rate of approximately 10,000 per year it seems that this small landing fee will prove ample to guarantee site owners against any unreasonable deficit. If there should be a deficit at the end of a year's operation, it would be charged to site owners pro rata, a deficit of $10,000 calling for the payment of only $30 by each owner of a six plane hangar site.

Development of the airport is by sales of hangar or factory sites and by rental of land or building space. Already the Heffron-McCray-St. John Co., developer, has erected three large hangars with a total floor space of more than 500,000 sq. ft., while one large hangar and three factory projects have been erected by private interests on land purchased outright. Rental fees are quite reasonable, starting at $35 per month for the ordinary light biplane, and this fee gives the operator all commercial privileges of the field. No exclusive concessions are granted, such as restaurant, filling station, or engine service establishments, but projects first on the field are protected from unfair competition. Although no landing fee is charged during the development period, operators from other airports are not permitted to come in and fly from the field for student or passenger work, in competition with firms on the field, unless they pay a rental fee for the privilege of using the runways.

ESTABLISHMENT of the Los Angeles Metropolitan Airport as a training and aircraft sales center has served to concentrate the attention of interested persons at that point, more than offsetting the competition which results from many organizations operating from the same base. There are now more than 20 different commercial aeronautic enterprises located on the field, exclusive of many private plane owners who rent space. It is apparent that with this number of co-operators the

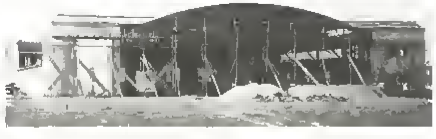
A typical view of the section reserved for spectators at the Airport on a Sunday

expenses of operating and maintaining the field can never be so heavy as where one operator maintains his own exclusive airport. Another factor of real benefit to dealers and school operators is the concentration of engine and plane manufacturing and repair activities at one point, thus giving the plane purchaser a chance to see manufacturing in progress and giving students the opportunity of learning construction and repair first hand.

An air view of the Los Angeles Metropolitan Airport, showing the field as it appeared at the time of its dedication. The two hangars shown can house 65 medium-sized planes.

In developing the airport it was not arbitrarily determined that a manufacturing and sales center should be set up, but many months before announcement of the project was made the Heffron-McCray-St. John Co. secured the services of Waldo D. Waterman, widely known aeronautical engineer, as chief engineer and general manager of the airport project, and to him was entrusted the work of planning such a development as would fit the tract of land in question.

Because of its perfectly level, well drained surface, freedom from neighboring hills or obstructions of any sort, and nearly ideal weather conditions, the site was suitable for any type of flying activity. Although the location in the San Fernando Valley, some 20 miles northwest of downtown Los Angeles, provided excellent proximity to large residential areas of Hollywood, Glendale and the valley itself, the comparative isolation from business centers precluded any possibility of developing the site as an air transport terminal. Good highways and the presence of a main rail line along one side of the field, coupled with ample cheap water and electric power, caused the decision to develop the field into an aircraft manufacturing and servicing base, flight training and airplane sales center. Thus the airport plan was generated to fit the land and its location, this method being in sharp contrast with the Grand Central Air Terminal at Glendale, Calif., where C. C. Spicer conceived the need of a terminal for transport lines and bought up many small parcels of land, razed homes and orchards, and even moved one established factory in order to provide space for the necessary runways. Certainly the former plan is the more efficient.



No. 3 hangar at the Los Angeles field in the course of construction.

With an airport area of a little more than 400 acres, Mr. Waterman laid out two runways, each 4,000 by 1,000 ft. and crossing at approximately right angles. The width of the runways makes it unnecessary to have more than two, especially in view of the fact that no regularly scheduled transport operations are planned. Factory sites have been assigned bordering the railroad right-of-way which bounds the north edge of the field; and the east-west runway is laid out along the south side of the factory land and near the north end of the north-south runway. This permits the development of the larger area on the south side of the field for use of various operations requiring a large amount of hangar space. The hangars are arranged to face 200 ft. taxi lanes leading into the north-south runway, while a wide street runs along the rear of each double row of hangars to permit easy access without interference with aircraft.

At the southwest corner of the runway intersection a five-story control tower has been erected, within which are the field offices, weather bureau office, room for a wireless operator, and a dispatcher's office on the top floor. A lighted wind cone is carried on the tip of this tower as is a revolving beacon light of 12,000,000 cp. At the base of the tower is a BBT floodlight capable of lighting either runway for night operation, and boundary lights have been placed at the end of each runway.

Since the ground in the vicinity of the Los Angeles Metropolitan Airport is almost perfectly flat, very little leveling was required on the runways and adequate emergency landing area is available within a radius of several miles. A Fordson power unit mounted in an Austin Pup roller was used for smoothing and rolling the runways, and it is possible for one man to completely roll the entire runway area of the field three times per month with this equipment. Preliminary preparation of the field included a heavy sowing of red clover which is very hardy and grows close to the ground, where it spreads in all directions and roots firmly. This clover is being encouraged over the entire runway surface and, it is believed, will provide an excellent permanent surface. So far it has been found that action of the tail skids in tearing up the clover plants only results in rooting them down at new points, and once established it is thought that these plants will better withstand heavy service than any other sort of surfacing.

For smoothing the few rough or hard spots on the runways the roller is fitted with a heavy duty scarifier or chisel harrow mounted on the front end in such a way that most of the six tons weight of the equipment can be brought to bear if needed. This harrow tears up the surface, the roller itself repacks the soil, and a three-blade float measuring 8 x 20 ft. is dragged in rear of the roller to smooth down high, and fill in low areas. The runways are now as nearly perfectly smooth as it would ever be practicable to get them.

Operation of the airport at the present time is under the direction of Waldo Waterman and strict rules relating to conduct of enterprises on the field and operation of planes from the runways are enforced. Field rules prohibit smoking in any hangar on the field; do not permit gassing planes, or doping them, within hangars; prohibit possession of intoxicating beverages on the airport, and in general assure that the various operations will be conducted in a businesslike manner. The result is to give the entire airport an attitude of efficiency which has so often been sadly lacking in flying field operations in the past.

Above: The service station established by Richfield Oil Company of California at the Metropolitan Airport to serve the aircraft operating there. Below: A front view of No. 1 and No. 2 hangars at the field.

Flying field rules have been carefully worked out and are neither so long nor so dictatorial as to be confusing or hampering. Someone is on duty at all times in the field operations office to see that these rules are enforced. Roughly, they provide that all Department of Commerce regulations affecting air traffic shall be in force on the field and that in addition all planes shall take off and land up wind, in the center of the runways, and parallel to the direction of the runway used; that all students flying solo with less than 10 hr. of solo to their credit shall carry yellow or white streamers at least four feet long on the plane, and that plane operators must at all times take special precautions not to blow dirt or dust toward spectators or parked automobiles.

Another provision requires tail skid equipped planes to carry a shoe of spoon type with an area of at least three square inches for every 100 lb. of tail skid load when the plane is fully loaded. All operators are required to conduct their flying activities from a point as near their own hangar as possible, no engines are permitted to be started unless the plane's wheels are blocked or a licensed mechanic or pilot is in the cockpit, and all landing planes are required to taxi at once to the side of the runway unless giving the right of way to some other plane. Flood lights are operated free of charge unless for a greater period than 20 min., in which case the charge is at the rate of $3 per hour. Someone is always on duty at the airport during the hours of darkness to operate the flood light for visiting planes. In addition to posting all rules governing activities at the airport each tenant or operator using the field is required to read a copy of the rules and sign an agreement to abide by them. Penalty for infraction of the rules is grounding of the plane and pilot so far as that field is concerned for a period of time varying with the nature of the offense. This penalty has been applied in one or two cases only and general observance of the rules is the order of the day. In the seven months which the airport has been operated there have been no serious accidents of any sort.

Since the field was officially dedicated on Dec. 16, 1928,

it has enjoyed a constantly increasing popularity. Part of this is due to the field facilities and management and much of it to the strategic location in relation to population centers, air travel routes and other leading airports. At the present time all manufacturing activities of the Bach Aircraft Co. are carried on in a group of five factory buildings adjoining the railroad on the north border of the field. Production has been started on the "Sunbeam" plane in the new Commercial Aircraft Co. factory building, and a factory building for the Apache Engine Co is nearing completion. Three large hangars have been placed in service by the airport company with all space contracted for and in constant use and a fourth hangar has been built by Lynn Hayes, and is in service as head-

Erecting the structural steel framework for the first unit of the factory to be occupied by the newly organized Apache Motor Company at the Los Angeles Metropolitan Airport

quarters for the distribution of Cessna, Buhl, American Moth and Swallow aircraft. A public restaurant has been in operation since the opening of the field and a Richfield filling station, located at the runway intersection, has been operated since the first of the year. In addition to the Richfield station a Standard Oil Company station is now in service and a Gilmore station is to be erected before the end of July. No oil company trucks are allowed on the field unless that company rents or owns space on the field. All factory and hangar construction is of the most modern and permanent type, factories and hangars being of masonry, concrete and structural steel.

A 200-ft. railway siding and 20 x 60-ft. loading platform are now in use and a large permanent warehouse is planned for erection within the next 60 days as a fireproof storage place for new aircraft and supplies.

In addition to these activities there are representatives on the field for the following aircraft: American Moth, Swallow, Bach, Cessna, Mohawk, Commercial Sunbeam, Stearman, Travel Air, Buhl, Lockheed, Waco, American Eagle and Stinson, and many sales are being made from the field. The following firms either maintain buildings of their own or lease space from the airport: Aero Brokerage Service Company, Aero Wire Service and Supply Co., Apache Motor Corporation, Associated Aircraft Company, Inc., Bach Aircraft Company, Inc., Commercial Aircraft Co., George R. Craig Co., Golden Arrow School of Aviation, Lynn Hayes Aero Corporation, H. C. Lippiatt, Morrison Aircraft Corporation, Leo Nomis, Pacific Aeromotive Corporation, Prudential Aircraft Company, RoamAIRcraft Co., Sanders Air Service, Porter and Hughes, Roy T. Minor, T. C. Ryan Flying Service, and Walter Hawkins. In addition to these firms there are a great many private owners who either rent space from the airport company or sublet from some of the operators.

Any statement of the many activities now being conducted by the above firms would be too lengthy for this article, but it is apparent that a very real concentration of aeronautic activities has been effected on a field which was so much waste land seven months ago.

The most significant part of the very real success which has attended the development of the Los Angeles Metropolitan Airport is that the same plan can be made to fit almost any other section of the country. There is no secret formula to the operation of a successful airport, and it is apparent that of all factors entering into such success the most important is to plan the airport project to fit some particular phase of aviation activity. If aviation leaders in many fairly large towns would approach real estate syndicates with the proposition of developing airports along the same plan as that which has been followed in developing the Los Angeles Metropolitan Airport, there is no reason to doubt that the number of worth while airport projects in the country could be materially increased in a very short length of time.

A view of the Metropolitan Airport as it appeared while in the course of construction. The billboard at the right shows the layout of the field and refers all those interested to the headquarters of the development company in Hollywood

AIRPLANE *Descriptions*

Overland Sport Trainer

Production is to be started in the near future by Overland Airways, Inc., Omaha, Neb., on a two place tandem sport and training plane powered with LeBlond 60 (5-D) radial air cooled engine. The Overland Sport Trainer was recently test flown to the satisfaction of the manufacturer and found to have a high maximum speed and a low landing speed.

Structurally the plane conforms with conventional practice having a wooden wing, chrome molybdenum steel tube fuselage, and fabric covering. The upper wing span is 27 ft. 4 in., the lower wing span 26 ft. 4 in., and the overall length 18 ft. The weight of the plane empty is 660 lb. and the gross weight loaded is 1,200 lb. The wing cellue consists of four panels of equal lengths, a center section and the customary form of "N" strut and wire external bracing. The upper wing is flat while the lower has a dihedral of 3 deg. The chord is 44 in., the gap 48 in. and the stagger 18 in. Wings are rectangular in plant form, ailerons are provided in lower wing only and inset one rib from the tip. A modified U. S. A. 27 airfoil section is employed for both wings.

A Warren truss type of structure constitutes the fuselage. The entire tail section is of welded steel tubing. All controls are push and pull tubes excepting the rudder which is operated by cables. The stabilizer is adjustable in flight while fin adjustments are made on the ground. The entire structure is covered with grade A fabric and lacquer finishes in any color are available. Elevator

Rear view of the LeBlond 60 powered Overland Sport Trainer

and stabilizer units are interchangeable. Dual controls including switch are provided.

The specifications as furnished by the manufacturer are as follows:

Span upper wing	27 ft. 4 in.
Span lower wing	26 ft. 4 in.
Chord	44 in.
Length	18 ft.
Wing area	180 sq. ft.
Lower Wing Dihedral	3 deg.
Weight empty	660 lb.
Gross weight loaded	1,200 lb.
Power plant	LeBlond 60
Fuel consumption	4½ gal. per hr.
Fuel capacity	15 gal.
Oil capacity	4 gal.

J-6 Powered Spartan C-3

A new model designed around the J-6, 165 hp. Wright New Whirlwind engine has been announced by the Spartan Aircraft Company, Tulsa, Oklahoma. This model is similar in respect to the previous sport model with the exception of the power plant.

The plane has a wing span of 32 ft., an overall length of 23 ft. 2 in., a height of 9 ft. The weight empty is 1,555 lb., and the useful load 915 lb., giving a total gross weight of 2,460 lb. According to the manufacturer the

A front quarter view of the J-6 Whirlwind powered Spartan C3 Biplane

plane has a cruising speed of 100 m.p.h., a high speed of 115 m.p.h., a landing speed ranging from 42 to 48 m.p.h. depending on load. The plane takes off in 8 to 11 sec. and has a rate of climb, fully loaded, of 500 ft. per minute.

As in the case of the other Spartan models the fuselage is built of chrome molybdenum steel tubing and the wings of wood, internally braced, and wired for navigation lights. Fabric covering is used throughout. The landing gear is of the divided axle type, having a 76-in. tread and oleo shock absorbers, well streamlined. 30x5-in. Bendix wheels and brakes are used.

Instruments include oil temperature gauge, oil sight gauge, two-point switch, air speed indicator, tachometer, altimeter, and compass. Dual controls also are provided. Standard equipment includes Hamilton steel propeller, booster magneto and an adjustable stabilizer, as well as a 10x3 tail wheel.

The specifications as furnished by the manufacturer are as follows:

Span	32 ft.
Overall length	23 ft. 2 in.
Height	9 ft.
Weight empty	1,555 lb.
Gross weight loaded	2,460 lb.
Power Plant	Wright J-6
Rating	165 hp. at 2,000 r.p.m.
High speed	115 m.p.h.
Cruising speed	100 m.p.h.
Landing speed	42 to 48 m.p.h.
Take off	8 to 11 sec.
Rate of climb	500 ft. per min.

The Avro "Antelope"

TEST flights were recently completed by A V Roe & Company Ltd, Newton Heath, Manchester England, on the "Antelope" two-seater high performance, light bomber, designed and built for the Royal Air Force The Antelope is an all-metal, single-bay, biplane having a wing span of 36 ft, a length overall of 31 ft 2 in, and a height overall of 10 ft 9 in The total weight empty is 2,687 lb The military load including crew is 1,852 lb and the total weight loaded is 4,539 lb

This airplane is powered by a Rolls-Royce type F XI B engine a 12-cylinder, water cooled power plant

A side view of the Avro 'Antelope" high performance bomber

developing 538 b hp at 3,000 ft At 5,000 ft the plane has a high speed of 173 m p h, and at 20 000 ft, a speed of 136 m p h The landing speed is 60 m p h, and the service ceiling 20,700 ft

The Antelope is designed to carry the pilot, gunner bomber, about 300 lb of bombs, one synchronized and one flexible gun, radio equipment, parachutes and oxygen apparatus and fuel for four hours at a cruising speed of 150 m p h Although designed primarily for bombing the machine can also serve as a two-seater fighter or reconnoissance airplane

Spars and ribs are of duralumin and fittings are of stainless steel The fuselage is built on a framing of duralumin angle section covered with duralumin sheet which is riveted Engine mounting and tail unit are built up of welded steel tubes The landing gear is of the cross-axle type with a combination of oleo and rubber shock absorbers

An underslung radiator is employed in the cooling system and fuel is supplied from one main and one gravity tank both in the fuselage behind the firewall An engine driven pump feeds the gravity tank from the main tank

The specifications of the Antelope, as submitted to AVIATION, are as follows

Span (upper wing)	36 ft 0 in,
Span (lower wing)	32 ft
Cord (upper wing)	7 ft
Cord (lower wing)	5 ft
Length overall	31 ft 2 in.,
Height overall	10 ft 9 in.,
Wing area	377 sq ft

Weights

Wing structure	545 lb.,
Tail unit	83 lb.,
Undercarriage	171 lb.,
Fuselage	551 lb.,
Total structure weight	1 350 lb

Power Plant Weights

Engine	883 lb.,
Propeller tank exhaust pipe starter, etc	554 lb.,
Total power plant	1,437 lb
Total weight empty	2,687 lb.,
Military load including crew	1 852 lb.,
Total loaded weight	4,539 lb
Wing loading	12 lb. per sq ft,
Power loading	8 4 lb. per hp.

Performance

Height (ft)	Time to (Min)	Speed (m p h)
1 000	0 7—	—
5 000	3 6	173
10,000	8 2	167
15 000	15 5	157
20 000	32 3	136

Landing speed 60 m p h Service ceiling 20 700 ft

Kinner Powered Kitty Hawk

A NEW model of the Kitty Hawk biplane designated B-4 and powered with the Kinner K-5 radial engine has been announced by the Bourdon Aircraft Corporation Hillsgrove R I The Kitty Hawk B-4 is similar in general design to the B-2 which is powered with the Yankee engine It is manufactured under Department of Commerce Approved Type Certificate No 166

The Kitty Hawk B-4 biplane has a wing span of 28 ft a length of 22 ft 11 in and an overall height of 8 ft 6½ in The wing area is 233 sq ft The weight empty is 1,107 lb and the gross weight is 1,875 lb

As in the case of the B-2 model, the new plane is a three place open cockpit, single bay type Conventional

The Kitty Hawk B-4 powered with the Kinner K-5 engine

practices are followed in wing and fuselage construction the wings being of wood and the fuselage of welded steel tubing

Dual stick and rudder pedal control can be installed when the airplane is to be used for instruction purposes Instrument equipment is furnished as recommended by the Department of Commerce

Landing gear is of the divided axle type and is so designed as to be easily removable for replacement or repair A fuel capacity of 35 gal is provided

THE HEINKEL *Catapult*

ON THE S.S. "BREMEN"

THE HEINKEL K2 catapult installed upon the North German Lloyd liner "Bremen" which figured prominently in the establishment of the recent trans-Atlantic mail record, is the result of two years of experimentation and development by Dr Ernest Heinkel its designer Dr Heinkel is also the designer and builder of the Pratt & Whitney 'Hornet' powered, H E 12, low wing monoplane, which was catapulted from the Bremen at a distance of 20 mi off shore during the maiden voyage of the new steamship

During the period of development of the catapult, approximately 60 trial starts and a number of improvements were made These improvements and the original details have been patented in almost all of the principal countries of the world

The Heinkel H E 12 seaplane being launched from the K2 catapult aboard the S S 'Bremen'

The Heinkel catapult, which on the Bremen is installed on a turntable amidships between the funnels consists essentially of five units the turntable, rail bearer or runway, skid or car, compressed air accelerating and testing devices The maximum weight of the catapult and load is 3,500 kg (7,700 lb) The accelerating distance or run is 20 m (65 6 ft), while the braking distance for the skid is 3 m (9 84 ft)

The runway is a riveted structure built up of iron of standard section and is mounted on the turntable so that the start can always be made up wind The turntable, which has an angular travel of 180 deg, is actuated by a crank

As in the case of the U S Navy catapults the starting carriage is fitted with four shoes which slide along the rails on each side of the runway In this respect the Heinkel catapult differs from that built by the Chantiers Company on the French Line Steamship "Ile de France" The launching carriage in the latter case was mounted on wheels (The Ile de France catapult was described briefly on page 336, of AVIATION July 28, 1928)

A drag cable attached to the front end of the skid passes over junction rollers at the front end of the rail bearer structure and back through a system of pulleys arranged to provide a ratio of approximately six to one between the accelerating distance on the runway and the stroke of the piston, to which the cable is attached

The apparatus is so constructed that the car, after traveling the first meter acquires the full acceleration force The maximum possible acceleration is 3 g A quick release hook which holds the airplane in its initial position, opens automatically, and, at the end of the runway, the motion of the car is arrested by a grip device attached to the upper side of the float bearer and actuated also by compressed air The launching speed of the H E 12 plane from the K2 catapult is 110 km (62 2 m) per hour

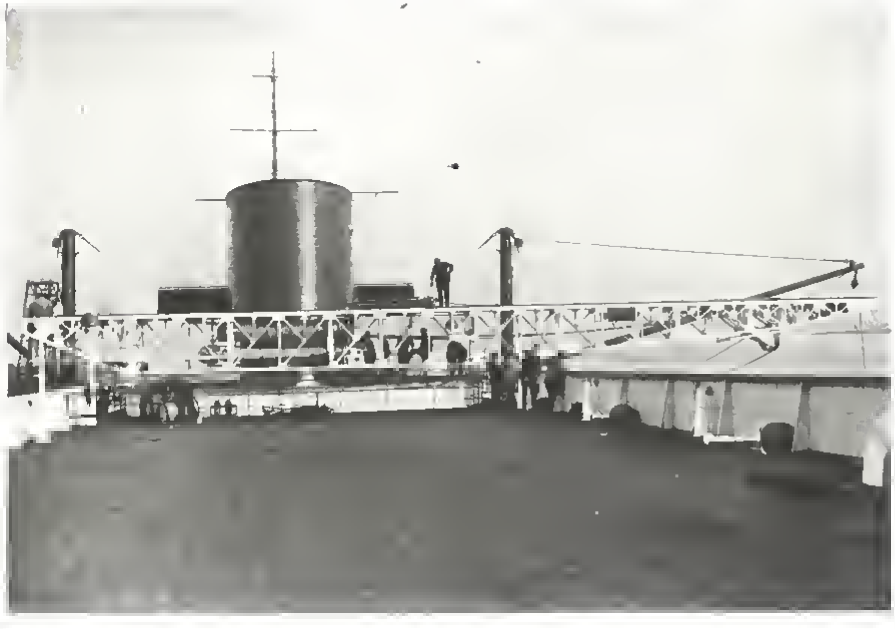
The compressed air actuating mechanism for the catapult consists of a storage cylinder having a capacity of 2½ times that of the cylinder in which the piston operates It is of course necessary for the cylinder to be under a lower pressure before the skid is released so that the drag cable will remain tight and no jerks will result

In the particular installation on the Bremen compressed air is furnished from a source of supply on the ship and piped to the catapult.

Control of the releasing mechanism is effected either by the pilot himself from the cockpit or by an operator on the service stand at the rear of the catapult runway.

One of the original features of the Heinkel catapult is the testing device which eliminates the necessity of the usual 'dead load" test to determine whether or not the catapult is operating properly. This apparatus consists of a heavy fly wheel of such weight that the force required to rotate it is approximately equal to that required to produce the desired linear acceleration of the airplane. This wheel is coupled to a drum upon which the drag cable is coiled and attached by its free end to the skid. When the pressure in the cylinder is released the skid moves forward, causing the flywheel to rotate. An automatic releasing device uncouples the flywheel from the drum leaving it to run free at approximately the same number of revolutions per minute to which it previously had been brought. The terminal velocity of the skid and the available energy in the accelerating mechanism can easily be determined on the basis of the reading of a revolution counter attached to the flywheel and located in a control box at the rear of the catapult structure and below the service stand.

Above: A photograph taken from the rear of the cull houses alongshore, showing the skid, drag cable and locating device. This testing apparatus eliminates the necessity of the usual "dead load shots." Below: The top deck of the North German Lloyd Steamship "Bremen," showing the catapult cull bearer in one of the usual launching positions.



The seaplane catapulted from the Bremen on its maiden voyage is powered by a 525 hp Hornet engine of American manufacture. As previously mentioned the plane is of the low wing, float type built by the Heinkel Works of Warnemunde, Germany. It has a wing span of 16.83 m (55.3 ft.); an overall length of 11.60 m (38.04 ft.) and an overall height of 4.5 m (14.76 ft.). The weight empty is 1,570 kg (3,454 lb.) and the gross weight 2,550 kg (5,100 lb.). Provision is made for the pilot and one other person, as well as a large quantity of mail to be carried in the catapult plane.

AIR TRAVEL

Ticket Office

By Walter E. Burton

A view of the Consolidated Air Travel Ticket Office and Information Bureau located on the mezzanine floor of the Cleveland Auto Club, Cleveland, O.

ONE OF the biggest problems confronting a city which is trying to become generally airminded is the establishing of a satisfactory contact between the airplane operator and the public. Cleveland, Ohio, for one, has found that its Consolidated Air Travel Ticket Office, information bureau and waiting room is an ideal means of promoting interest in all phases of aviation.

It was on February 15 of the present year that the office was opened for business. During the following three months, more than 600 reservations for aerial trips were cleared through it. This record, which was considerably greater than had been anticipated, is remarkable because the bureau, being new, was not generally familiar to Clevelanders, and also because the months of February, March, April and the first half of May were not exactly ideal for flying activities.

The Consolidated Air Travel Ticket Office, with its information headquarters, is located in the spacious touring bureau of the Cleveland Automobile Club, 712 Superior Ave., just a short distance from the Public Square. It provides all of the facilities and conveniences usually associated with a modern railroad terminal. A large supply of pamphlets descriptive of local aviation organizations and activities is always on hand. There are comfortable chairs for patrons who are waiting for a bus that will take them to the Municipal Airport to meet a plane. These buses, operated by the bureau on a regular schedule, meet all incoming and outgoing planes.

The office is prepared to sell tickets for air travel over established airlines anywhere in America. But of course, most of its business concerns lines connecting with Cleveland. Aside from the selling of tickets, the chief purpose of the air travel headquarters is to dispense information to the public in every way it can—in other words, to sell aviation to Cleveland residents and visitors. Its success along this line is indicated by more than 1,500 inquiries that it received and answered by mail and telephone during the first three months of its service. This considerable volume of queries indicates that the Fifth City is already airminded, but the bureau is endeavoring to make it even more so.

This convenience for Cleveland air travelers was one of the major steps taken by the Cleveland Airport Operators Association shortly after its organization. The group, meeting early in February, adopted a set of by-laws, and then named a board of directors and officers.

G. G. Jury, traffic manager of Stout Air Lines in Cleveland, was named president of the operators' group. J. F. Martin, manager of the Clifford Ball Air Lines, was elected vice-president, and Clifford Gildersleeve of the United States Air Lines, Inc., secretary-treasurer.

The four members of the association's directorate are G. K. Murphy of the Colonial Western Airways, Inc., E. M. F. Moore of National Air Transport, Inc., H. E. Smith of the Thompson Aeronautical Corp., and H. R. Reitz of the Stewart Aircraft Corp.

Companies which have been admitted to membership include the Dungan School of Aviation, Clifford Ball Air Lines, National Air Transport, Inc., United States Air Lines, Inc., Skyways, Inc., of Ohio, Stewart Aircraft Co., Stout Air Lines, Thompson Aeronautical Corp., and Universal Air Lines System.

A short time after the organization, the association, by unanimous vote, accepted an offer made by the Cleveland Automobile Club concerning the establishing in the club's quarters of a consolidated ticket office, information bureau and waiting room.

"Establishment of this union depot for air travel," president Jury points out, "is one of the most important steps taken in the interest of air travel in Cleveland since the Municipal Airport opened four years ago.

"It means that all of the inconveniences heretofore attendant to air travel in and out of Cleveland has been swept away. It means that the first step has been taken here toward giving the public, in a systematic and comprehensive way, the many advantages of aerial transportation for business, and its multiple charms and lure for pleasure. In short, the facilities are now available in a location readily accessible to everyone for dispensing of reliable information concerning commercial aviation."

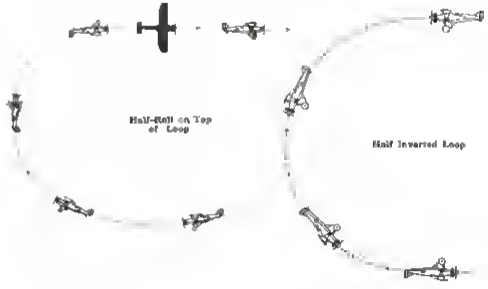
For several months prior to the creation of the consolidated ticket office, a portion of the Cleveland Automobile Club's touring bureau had been dispensing information concerning airline schedules. But it was not until the opening of the air travel bureau and ticket office as a distinct unit in itself that the selling of tickets began.

Members of the airport operators' group are anticipating an immense volume of business during the first year of the bureau's existence. Cleveland, located on some of the nation's principal airways, is out to get its share of air travel business. And the vanguard of its efforts is its Consolidated Air Travel Ticket Office.

ENGLAND'S TENTH ANNUAL

Royal Air Force DISPLAY

By Earl D. Osborn



A reproduction of a part of one of the pages of the program issued at the Royal Air Force display at Hendon

ENGLAND'S big annual air event is the Royal Air Force Display and "a jolly good show" it is It takes place at Hendon, just outside London, and this year was held on Saturday, July 13 It is similar to our National Air Raees in that it is a big public exposition of flying but here the similarity ends The show is put on entirely by the Royal Air Force which, of course, includes both military and naval air operations Not only this, but the majority of the events were demonstrations of actual military maneuvers rather than stunts meant to dazzle the spectators

Our shows are national merely in the sense that they attract fliers and men of the industry from all over the country The R A F Pageant is national in the sense that it is intimately tied up with national policies and national defense Royalty and the whole diplomatic eorps are present and the Pageant has a high social standing The fact that attendanee at the pageant is one of those things which is "done" helps to draw the desired class of officer into this newest branch of the serviee and put it more on a basis of equality with the older and more famous units of national defense Beside this, the pageant affords a wonderful and eolorful opportunity lor the members of the House of Lords and the House of Commons to see the work of the English airmen and to realize the possibilities of the airplane It is in realty a review of England's fighting air force

The final rehearsal for the R A F display at Hendon

Hendon is a war-time airdrome situated about fifteen mi from London It can be reached by train tram car or bus, under normal circumstanees, in less than an hour Somewhere between 100 000 and 150,000 people were in the enclosures beside many people on the surrounding hills who avoided the entranee fees These were quite high, varying from $0 50 to $2 00 with additions for reserved seats and parking spaces The proceeds go to Air Forec charities Parking space was provided for about 15 000 cars

One of the most notable differences, as compared to an American show, was the number of special enclosures which had been provided The Royal enclosure was arranged, of course, with much style and dignity, having tapestry chairs for the Royal party and comfortable wicker chairs for the diplomatic corps Behind were several large tents in which refreshments were served Beside the Royal enclosure, on one side, were the Air Council boxes, and on the other were the enclosures for the House of Lords and the House of Commons Behind was a promenade space and then grandstands with reserved seats The gayest enclosure was that of the Royal Air Force Club

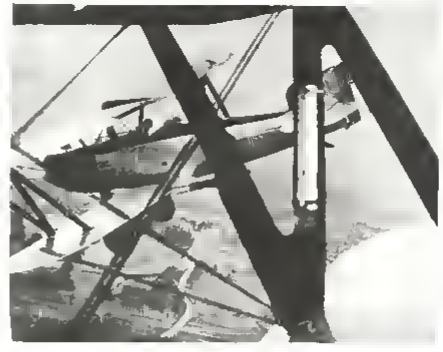
THE ENCLOSURES were all at one end of the field On two other sides were public areas with no reservations exeept in the grand stands The planes were parked on the far side of the field Radio loud speakers with individual batteries were placed at intervals all around the field, and musical numbers as well as the program of events were broadcast

The program itself was excellent giving the detail of what was to be done and why a brief description of the equipment to be used and the personnel that was to fly it The crowd was held baek from the field by a low picket fence, and the rule that no one was allowed beyond the fence was strictly adhered to There were no groups of pilots officials and friends conspicuously blocking people's view In short, the whole of the arrangements for the handling, placing and comfort of the visitors was excellently done

The main flying program was held between 3 and 5 p. m. This was preceded by a series of preliminary events, starting at noon, themselves a good show

The opening event at noon was a race conducted by reserve officers in Avro training planes The flying was excellent but it is hard to get much thrill out of an Avro as a racing plane. The two pilots giving the exhibition were runners up in the Fighting Area Aerobatics Competition A slow flying demonstration was given in a slotted wing Moth and this was followed by a relay race, a demonstration of artillery observation, and a handicap race between some war-time Bristol Fighters and modern Fairey III F s. The latter event afforded a very interesting demonstration of the progress which has been made in pursuit plane design

Next, two Gloster Grebes fitted with Armstrong-Siddeley "Jaguars" were cavorting around the skies trailing great streamers of orange smoke These looked well against the bright blue sky and accentuated the effect of the aerobatics which the planes were performing. The apparatus for producing the smoke was furnished by Skywriting, Ltd. and certainly made the stunting more interesting to the spectators To the technically minded it was interesting to note how long the smoke stayed in violent commotion after the plane had passed This event was made more interesting to the public by the diagrammatic descriptions in the program showing what the various maneuvers were and how they were performed [This use of colored smoke as an aid to following the evolutions of the stunting planes also received the commendation, as an outstanding feature of the Pageant, of an American woman pilot witnessing the display —Editor.]



Bombers diving in formation

AT 3 P.M. the fourteen main events were started There was not a hitch in any of them While one event was going on the planes for the next event would taxi up to the line preparatory for taking off When their time was up the performing planes would fly to the lee of the field and sneak in without interfering with anything As the field is not a very large one it took good flying to bring in a formation and get it out of the way for the next event Many English claim that our service squadrons have better planes than theirs, but there is no doubt that the R A F as a fighting force is a machine of tremendous efficiency

The first event of the main program included evolutions by Fighter Squadrons Nos 1, 25 and 43 The twenty-seven planes took off in formation and went through a series of maneuvers Probably the most practical of these was a squadron cross-over, but the prettiest was flying in eoncentric circles, each plane behind the other. The planes left the circle in a long line which went through a series of figure eights and spirals. Finally when it reached a given point eaeh plane in succession rolled over onto its back and did a half loop, thus reversing the direetion of flight. As the air was rather bumpy the formations were not extraordinarily steady or tight but the average of the flying was very even and no one got far out of line The planes took off and flew in groups of three, three of these forming a squadron

Individual aerobatics, next on the list, were done by two Gloster Gamecocks fitted with Bristol Jupiter engines The pilots were the winners of the Fighting Area Aerobatics Competition There were several pretty maneuvers where the pilots dove at eaeh other from opposite directions and passed each other close to the ground, eaeh going into half rolls and other simultaneously executed maneuvers after they had passed The idea was good, but one could not wateh the two fliers at the same time and, besides, they could not time their stunts at exactly the same speed and one would usually finish before the other

The most popular event on the list was a formation

parachute jump Three Vickers Vimy bombers of the type which first flew the Atlantic flew so close that the wings of the outer pair seemed from the ground to be touching the tail of the leader The six men pulled off at the same moment and there were not 5 sec between the landing of the first and last man This drew the only audible applause that was heard from the crowd It took the form of a decorous handclapping

As the parachutists landed, five Supermarine Southampton flying boats appeared on the horizon crossing the field at a very low altitude These machines are of the type which flew to China and Australia last year They have the appearance of seaworthy and efficient craft England is far ahead of us in the production and use of sea going aircraft

[The participation of the flying boats over Hendon, is noteworthy since the nearest body of water of size sufficient for flying boat operations is about 8 mi away —Editor]

The fifth event was an attack by single seater fighters on an "enemy" encampment The attack was made by criss-cross diving from various directions accompanied by the crackling of machine guns and the explosions of light bombs The next event demonstrated a fight between two pursuit planes and a bomber One of the attacking planes came down with great clouds of smoke belching from it and the wings lit up by calcium flares After much agile maneuvering on the part of the Boulton & Paul bomber, it also was brought down in flames The flares and smoke made the fight very real to the onlookers A squadron of planes then picked up messages from strings stretched between rifle butts This requires most accurate flying and was interesting to watch

Three instructors from the Central Flying School gave an exhibition of stunt formation flying in Moths fitted wth Genet engines This flying was excellent and resembled the maneuvers performed by the "Three Musketeers" and the "Sea Hawks " Due to the small size and slow speed of the planes the stunts were not as impressive as if done with larger planes, but this does not detract from the accuracy of the flying and the splendid teamwork of the performers The Genet engines ran perfectly upside down, whereas most of the engines in the fighting planes were not fitted for this type of flying

Fairey Fox two-seater day bombers, which were originally designed around Curtis D-12 engines, gave an exhibition of low bombing following a power dive These planes seem very fast and clean in their lines

The closing event was a complicated series of attacks and counter offensives against a port which was preparing to send out an expedition against British territories Observation planes, day bombers, night bombers and pursuit planes all took part Anti-aircraft fire was heavy and the bursting of the Archies was well simulated by smoke bombs thrown from the planes and exploding just behind them An observation balloon was brought down in flames, while mock battleships, buildings and munitions dumps were blown up in a series of bombing and machine gun raids Altogether there was a lot of noise and excitement and everything burned up and exploded just when and as it should

The Fighter Squadrons which took part in the pageant were Nos 1, 3, 19, 23, 25, 29, 41, 43 and 56 The Bomber Squadrons were Nos 7, 10, 12, 99, 101 and 207 Besides this there were two Army Co-operation Squadrons, Nos 13 and 26, and (Fleet Fighter) Flight No 405 Almost all of these squadrons had their origin during the war and some of these numbers may sound familiar to our readers

Although there was little wind, the day was exceptionally hot and the air evidently rather bumpy making it difficult to maintain proper level and position in the formation flying Most of the formation flying was that used in actual combat work and there was an almost continuous shifting from one position or formation to another This made it somewhat harder for the fliers to get and maintain exact positions and a little harder for the spectators to grasp the significance of the formation

In all there were about two hundred planes which participated in the pageant and about five hundred of the Air Force personnel were detailed Participation in the Pageant is a mark of fine flying done during the past year, but many of the fliers and many of the squadrons which appeared in the Pageant of a year ago have been shifted elsewhere and are on active duty in Mesopotamia or in India Although the squadrons participating are picked because of merit and are given a chance to practice together, they are not drilled or kept together purely for show purposes The flying done in India and along the Euphrates is too important to neglect and as squadrons become sufficiently trained they are sent out for practical experience

Probably the most impressive aspect of the Pageant was the absolute perfection of its operation. Those who have been in the flying game realize how easy it is not to start on time but at the Pageant every event was begun exactly on schedule

Frankly, we are a little disappointed in the flying It did not seem either individually or collectively as good as the show that the Navy staged at Los Angeles last fall Teamwork and discipline were perhaps more evident and it may have had a more practical aspect, but from the spectacular standpoint it was not up to Los Angeles It is, of course, impossible to judge accurately by eye, but the majority of the pursuit planes did not seem to have the performance of ours, either in climb or speed Many seemed to be able to turn on a shorter radius than ours, but this again is hard to judge

Another disappointing part of the show, to a foreign visitor, was the fact that there was no opportunity to inspect the planes Also, none of the latest fighting planes or bombers took part There was no fly-by of experimental planes and as it was a purely military event, no civilian planes were allowed on the field As a demonstration of the efficiency of the Royal Air Force, the Pageant is most impressive. One cannot fail to realize that here is a fighting force which is disciplined and efficient

In the 2 hr of the main program one saw enacted the major phases of air attack and defense work and many of the problems which confront the air force were brought home to the public The Pageant is primarily a military event put on to interest and instruct the public, and the public recognition in turn must also stimulate the enthusiasm of those in the R A F itself The display, besides being excellently handled and serving a valuable purpose, is a most delightful event to attend

THE "St. Louis Robin" AND ITS REFUELING FLIGHT

How the Plane and Engine Were Equipped and Conditioned for Their Test

THE "ST. LOUIS ROBIN," the record breaking refueling endurance plane piloted by Dale Jackson and Forrest O'Brine, has been in the air for more than 17½ days as Aviation goes to press The fliers took off from Lambert-St Louis Flying Field, Anglum, St Louis County, Mo , Saturday, July 13, at 7 17 a m Central Standard time In the time that has elapsed, more than 44 contacts between the endurance and the refueling planes have been made in which some 3,300 gal of gasoline has been transferred, while more than 72 contacts have been made for all purposes It is not known how much longer the Robin will remain in the air Officials of the Curtiss-Robertson company have informed the pilots to use their own judgment, it is said

Refueling the record breaking "St Louis Robin" over Lambert-St Louis Flying Field

The record breaking St Louis Robin is a stock model Curtiss "Robin" in all respects except for the interior arrangement of the cabin. In fact it was taken from the final assembly line at the plant of Curtiss-Robertson Airplane Manufacturing Company, and was made ready for the flight Normally, this high wing monoplane seats a pilot and two passengers, but to make room for a 126 gal fuel tank behind the pilot's seat, and at the same time to allow sufficient space for Mr Jackson and Mr. O'Brine to change places at the controls, the double seat at the rear was omitted

The cabin of the plane was lengthened slightly, also, so that one of the pilots might stand behind the gasoline tank in the refueling operations There is not full headroom in the cabin of a Robin, of course, and in this particular case it is an advantage Openings were cut in the fabric on top of the fuselage, so that the man handling the refueling hose might stand erect The lack of headroom places his head and shoulders well above the top of the fuselage and in the proper position to handle the refueling hose Sliding panels constructed of sheet metal close the openings when not in use

There is a space of from perhaps 15 to 18 in between the top of the tank and that of the cabin roof Over the tank is an air inflated rubber mattress The rear portion rests on the tank, while the front is supported from the fuselage bracing It is on this mattress that one of the pilots rests while the other flies the plane. It might be added that Mr O'Brine and Mr. Jackson stand "watches" of four hours each Even with the refueling operations, the time required for pumping the gasoline into the wing tanks and that necessary for eating, it is estimated that each of the pilots is obtaining from eight to ten hours sleep in every 24 hr period as a result of the adoption of the "four on and four off" system of flying the plane

The refueling operations are conducted twice daily, once in the morning and once in the evening. A light load of about 60 gal. is taken aboard in the morning while 110 gal. of fuel is transferred in the evening. These loads are taken into the large tank in the cabin. There are two wobble pumps for the purpose of pumping the fuel into the two 25 gal. wing tanks with which a Robin is ordinarily fitted and from where it feeds to the engine by gravity. The refueling plane, like the record breaking craft, is a standard Curtiss Robin. However, its cabin is fitted out much in the same manner as is the St. Louis Robin. In addition the fabric has been removed from the sides and bottom of the fuselage around the pilot's seat, and celluloid has been substituted to provide greater visibility. A 40 ft. hose, one and one-half inches in diameter, is used in transferring the fuel loads. It might be added that two refueling planes were prepared so that the second might be used if trouble developed with the first.

THE OIL LOADS taken aboard the St. Louis Robin thus far have averaged five gallons in every 12 hr. period. As differentiated from some of the refueling flights in the past, though, the oil is not kept in the original cans. Aluminum containers, about three feet in length and six inches in diameter, are used. When one of these cans is taken aboard, it is slung from the cabin roof in a tilted position, so that the oil may be drained by gravity through a short hose to the oil tank of the engine. The free end of the hose is plugged, when the tank has been filled, and is fastened to an overhead bracket. Incidentally, the oil tank is fitted with a gauge of the type used on Ford motor cars, and arranged so that the "Empty" signal appears when there are actually two more gallons remaining. The aluminum containers are also used for transferring food and messages to the endurance plane.

To preclude, in so far as possible, the possibility of damaging the record breaking plane in one of the refueling operations and perhaps forcing it down, both the gasoline hose and the containers are weighted to prevent swaying when lowered from the refueling plane. The bottom of each of the aluminum containers is loaded with from 20 to 25 lb. of shot, while a canvas bag, filled with lead so that it weighs about 30 lb., is attached to the end of the hose. In picking up the empty cans, the refueling plane lowers a rope to which is attached a 10 lb. sash weight. This weight is removed by the man aboard the St. Louis Robin, whose task it is to secure the empty can to the line. Since the weights are fairly inexpensive, they are later dropped to the ground over a place where there is no danger of causing damage.

The Curtiss "Challenger" engine with which the record breaking plane is powered is also a production model. This engine, it will be remembered, is a six cylinder static air cooled radial. The cylinders are arranged in two staggered rows of three each, necessitating the use of a two-throw crankshaft. The rated horsepower of the power plant is 170 at 1,800 r.p.m. The fuel consumption, according to officials of Curtiss Aeroplane and Motor Company, Inc., the manufacturer, is .50 lb. per b.hp.hr. In the endurance flight, of course, the engine has been throttled as much as possible to conserve its life, and the fuel consumption has averaged about 7½ gal. per hr. There is one particularly interesting feature about the installation of the "Challenger" in the St. Louis Robin. Rubber tubes from the dash to the Alemite connections on the rocker boxes of the engine are fitted, so that the rocker arms may be greased as necessity requires. Separate exhaust stacks instead of a collector ring are also employed to eliminate back pressure.

Preparations for the flight were started June 17 with the arrival at the Curtiss-Robertson factory of S. K. Prince, of the Curtiss Company. Mr. Prince took charge of the installation of the engine, while William H. Schultz, of the Curtiss-Robertson plant, superintended the installation of the equipment in the plane. This work required several weeks as shown by the fact the plane did not take off until the morning of July 13. Shortly before the flight started, however, practice contacts were made between the endurance and refueling planes. It was necessary to establish only a few such contacts, though, as both crews rapidly became proficient. As a matter of record, only a portion of one afternoon was devoted to this preliminary work.

Left to right: Dale Jackson and Forrest O'Brine co-pilots of the "St. Louis Robin", William H. Schultz, who superintended the installation of the equipment in the endurance plane. Maj. C. Roy Wessall and Percy V. Chaffee, pilots of the refueling plane.

A view of the Curtiss Robin taken before the start of the endurance flight.

DURING the early days of the flight, the endurance plane maintained a 1,500 to 2,000 ft. altitude. As the flight progressed, the altitude was gradually increased until now the fliers commonly fly at from 3,000 to 4,000 ft. and sometimes even as high as 5,000 ft. The higher levels guard against excessive thinning of the lubricating oil as a result of the hot weather which has been experienced. No major difficulties of any kind have yet been reported. Of course, the pilots are watching the engine carefully. They have adjusted the carbureter, and on one occasion the spark plugs were changed, although officials on the ground said it was not necessary.

Everyone is highly enthusiastic, except the newspapermen, some of whom have had to camp on the field since the flight started. Curtiss officials, naturally, are more than pleased. Arthur Nutt, chief engineer for the Curtiss Aeroplane & Motor Company, Buffalo, arrived at the field last week and expressed the opinion the fliers would remain aloft 500 hr. Mr. Nutt, who designed the the Challenger engine, based his belief on the showing made by the engine on the test stand.

Telegrams and letters have literally deluged the fliers. In addition many St. Louis business houses and a number of firms in the aircraft industry have made donations. Those concerns in the aviation industry include Curtiss Aeroplane & Motor Company, Inc., The B. F. Goodrich Rubber Company, the Cook Paint and Varnish Company, Stromberg Motor Devices, Inc., and Sligo Iron Company.

A portion of the equipment used on the record flight of the St. Louis Robin follows. Scintilla magnetos, Stromberg carbureter, Zerk type Alemite lubricating system, Standard Steel propeller, BG spark plugs and Exide battery. "Naturalme" gasoline, "Gulfpride" oil and Texaco "Marfak" grease are being used. The refueling hose was made by The B. F. Goodrich Company.

A regulation Curtiss-Robertson instrument board containing Pioneer instruments, Kelsey Hayes wheels with Goodrich 26x4 in. tires and oleo shock absorbing struts manufactured by the Aircraft Products Corporation are units of the plane's equipment. Among the products entering into the construction of the airplane are, Summerill and Ohio Seamless steel tubing, Haskelite veneer, Twining "Flightex" Triple A fabric, Textile Leather Company upholstery, and Libby-Owens non-shatterable glass.

The personal equipment of the pilots includes Strauss & Buegeleisen "Resistal" goggles, and Venus ear drum protectors. Miscellaneous equipment includes an Eveready flashlight, Pyrene Fire Extinguisher, flares from the International Flare Signal Company, Dural Rubber stick handles, Russell safety belts and Johnson (Dayton, O.) first aid kit. The discs for the tail skid shock absorber were furnished by the U. S. Rubber Company.

The following are the specifications of the record breaking plane and engine as supplied to AVIATION by the manufacturers:

Curtiss "Robin" Monoplane

Span overall	41 ft. 0 in.
Length overall	25 ft. 1 in.
Height overall	8 ft. 0 in.
Load capacity pilot, 2 passengers, 50 lb. baggage	
Fuel capacity (maximum)	50 gal.
Gross weight	2,293 lb.
Maximum speed	120 m.p.h.
Cruising speed (1,440 r.p.m.)	96 m.p.h.
Initial rate of climb	750 ft./min.
Range (cruising)	303 mi.
Landing speed	45 m.p.h.
Service ceiling	16,460 ft.

Curtiss "Challenger" Engine

Type	Static aircooled radial
Rated power (1,800 r.p.m.)	170 hp.
Number of cylinders	6
Arrangement	two radial rows of three
Overall diameter	42⅜ in.
Bore	5⅛ in.
Stroke	4⅞ in.
Displacement	603 cu. in.
Ignition	2 Scintilla magnetos
Carbureter	Stromberg NA-U4J
Fuel consumption (cruising)	.50 lb./b.h.p./hr.
Weight	420 lb.

GENERAL NEWS

Test Under Way On Cup Race Plane

Packard "X" Powers Lieut Williams' Plane

PHILADELPHIA (PA)—With taxiing tests under way at this writing on the Delaware River, flight tests shortly are to be made of the United States Schneider Trophy Contest entry, a trim seaplane powered by a Packard 24 cylinder "X" engine to be flown in the international speed competition over the Solent, Cowes, England, Sept 6-7 by Lieut Al Williams, Navy pilot

Details of the craft, which designers hope will better the existing official world speed mark of 318 624 m p h established at Venice by Major de Bernardi in the spring of 1928 and the unofficial high speed record of 319 57 m p h. set later in that year by Flight Lieut D'Arcy Greig, are being withheld

It is understood, however, that in type the machine is a monoplane Its Packard power plant is reported to be the same as that which was employed in the machine built for the 1927 Schneider race but which failed of entry Engine experts hava extremely modified this power plant, however, for use in the present seaplane Frontal area has been reduced and power has been increased

The last Schneider race was that of September, 1927, at Venice, Italy, in which Flight Lieutenant Webster, R A F, set a new speed mark of 281 488 m.p.h., only to lose his record later to de Bernardi and Greig

In the race this year, flight places have been drawn as follows United States, No 1, England, No 2, France, No 3, and Italy, No 4

Questions Nebraska Fuel Tax

OMAHA (NEB)—As in many other states, questions as to the application of gasoline taxes to aviation has come up here City Commissioner Noyes, who has charge of the local municipal airport, has asked the city attorney for an opinion as to whether the four-cent gesoline tax in force in Nebraska applies to airplanes landing and taking off from the local field

Fokker Earnings Reported

NEW YORK (N Y)—Net earnings before Federal taxes of $357,427 for the quarter ended June 30 are reported here by Fokker Aircraft Corporation of America This, comparing with earnings for the first quarter of year of $139 984, is equivalent to $0 50 per share on the average number of shares outstanding for the period

Army Orders Douglas Planes

LOS ANGELES (CALIF)—Douglas Aircraft Company has announced the receipt of an order for twenty observation planes for the United States Army to be delivered by Nov 1 These planes will be used by National Guard units for training work. Forty airplanes of the same type were recently completed and delivered by the Douglas company to the Army

Increased Business Noted by Pioneer Firm

BROOKLYN (N Y)—More flight and navigation instruments have been sold by Pioneer Instrument Company, this city, in the first six months of 1929 than were sold during the entire year 1927, according to Charles H Colvin, general manager Pioneer was acquired recently by Bendix Aviation Corporation to strengthen the aviation accessory group

The statement released by Colvin shows that the first quarter of this year grossed a larger return in sales than the first five months of 1928 while records for the month of March shuw that 30 per cent more shipments were made during that period than during any other month in the company's history Following is a statement of gross sales: 1927, $550 000, 1928, $940,000, 1929 (estimated) $1,400 000

The Pioneer company is one of the largest manufacturers of navigation and flight instruments in the world Branches of the organization have been established in Washington, San Francisco, Los Angeles Chicago and Wichita in this country Foreign branches are located in Paris Milan, Berlin, Amsterdam, Madrid Tokio, Bangkok, Rio de Janeiro and Toronto

Plant facilities have been increased 50 per cent this year and another unit offering similar space is under way

Test Boeing 80-A on Route

CHICAGO (ILL)—Boeing Air Transport made a test flight west from Chicago to Oakland recently, using one of the new eighteen passenger Boeing transports it shortly will place in service to the Pacific Coast P G Johnson, president of Boeing Air Transport; K K Knickerbocker, Chicago traffic representative of the company; James P Ripley, vice president of the National City Bank; Herman Sartorius and Bayard Kilgour, Jr., both of New York; Thomas Finnegan, executive vice-president of the American Brake Shoe and Foundry Company and E N Saunders, president of the Northwestern Fuel Company, were among those who made up the party to the West Coast

Name New Directorate For Lockheed Company

LOS ANGELES (CALIF)—Reorganization of the Lockheed company personnel and production methods following its recent purchase by the Detroit Aircraft Corporation, is announced in this city by Edward S Evans, president of the Detroit group which has acquired the Lockheed plant

No radical changes will be made in the mechanic personnel of the factory, James Work, however, has been appointed general manager and is to install immediately advanced production methods designed to speed up the building of Lockheed planes

Changes in the directorate are as follows Fred E Keeler, president, Ben S Hunter, executive vice-president, Allan Loughead, vice-president, G Roy Boggs, secretary, and W. C. Collins, treasurer, submitted their resignations, these being accepted The following board was elected to fill the vacancies: Edward S Evans, president, Harold H. Emmons, chairman of the board, James Work, vice-president and general manager, M Howell, treasurer; Fred E Keeler, director; and Paul V. Fritsche, secretary

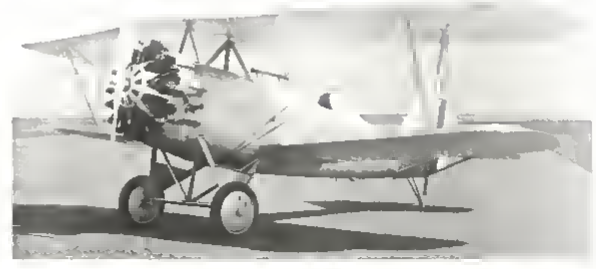
All production will be concentrated in the present Lockheed factory at Burbank, according to the announcement James Work new factory manager, was formerly manager of the United States aircraft factory at the Philadelphia Navy Yards, and is at present general manager of the Detroit Aircraft Corporation

Curb Unlicensed Joy-Hoppers

CHICAGO (ILL)—Following recent deaths in planes flown by unlicensed pilots, plans have been made to have county highway police enforce the state law prohibiting fliers other than those holding transport licenses from carrying sightseeing passengers The law is strictly enforced at the municipal airport, but at small outlying fields it has been discovered that pilots without licenses have frequently operated planes for sightseeing

Ohio Tour Will End at Races

COLUMBUS (OHIO)—"The Ohio Chamber of Commerce Good Will Tour," a caravan of about thirty planes to visit all airports in the state, has been announced by officials of the state organization The flight of four or five days duration, will begin at Port Columbus and end at the municipal airport, Cleveland, Aug 23 The arrival of the fleet will be a feature of the opening of the National Air Races, scheduled to begin next day at the latter field



A Front Quarter View of the Hall FXH 1

Sign American Eagle Time Payment Contract

KANSAS CITY (MO)—E E Porterfield, Jr, president of the American Eagle Aircraft Corporation here, and T T Hildebrandt, manager of the aeronautical division of Commercial Investment Trust, Inc, New York City, have just signed a contract permitting installment plan sales of American Eagle planes

The contract follows recent negotiation of an insurance treaty between the Liverpool, London and Globe Insurance Company, the Globe Indemnity Company and Commercial Investmeot Trust, Inc, through Barber & Baldwin, New York underwriting firm, under the terms of which the purchasers, dealer, and manufacturer are given protection in sales made under the deferred banking plan

A down payment of a third of the total sum involved in the airplane sale, which includes insurance charges, is required The remainder is payable in twelve monthly installments The service charge on the deferred payments is 10 per cent On aircraft sales, the paper will be sold to Commercial Investment Trust, Inc, by the American Eagle company or its sales representatives after the credit department of Commercial Investment Trust, Inc, and representatives of the underwriters have passed on the qualifications of the purchaser and set the insurance rate

Aluminum Firm Expanded

MASSENA (N Y) — Construction work on the two large additions to the Aluminum Company of America plant has been completed, and operation is to begin within a few weeks The firm's output of structural aluminum used in airplane and automobile making, will be greatly increased

Report 250 Axelsons Ordered

LOS ANGELES (CALIF.)—An order for 250 Axelson aircraft engines has been reported received by Axelson officials from the American Eagle Aircraft Corporation, Kansas City, Kan

Award P. & W. Plant Contract

HARTFORD (CONN.)—Levering & Carriques of New York and Hartford, has been awarded the steel construction contract for the manufacturing unit of the engine division of Pratt & Whitney's new $2,000,000 plant here, according to an announcement by Don L Brown, vice president in charge of manufacturing of the engine building firm. Steel construction work, Mr Brown said, is to begin Sept 12 and is to be completed, according to the terms of the contract, Oct 7

Safety Contest Entries Reach Total of Sixteen

NEW YORK (N Y) — Announcement is made here by the Guggenheim Fund for the Promotion of Aeronautics that six additional aircraft manufacturers have been accepted as participants in the $150,000 safe aircraft contest It is stated furthermore, that two British participants have withdrawn "because of pressure of work at home" in connection with government requirements These are Vickers, Ltd, and DeHavilland Aircraft Company, Ltd

The new additions, bringing the total to sixteen entries (twelve American, three English, and one Italian), are as follows: Cosmic Aircraft Corporation, Bridgeport, Conn; Cunningham-Hall Aircraft Corporation, Rochester N Y., Dare Airplane Company Detroit Mich.; Fleet Aircraft, Inc., Buffalo, N Y; Pitcairn-Cierva Autogiro Company, Bryn Athyn, Pa, and the Rocheville Aircraft Corporation, Los Angeles, Calif

Parks Offers Student Loans

ST LOUIS (MO)—Payment on the installment plan for flying courses is now possible for prospective students of Parks Air College according to an announcement by Harry P Mammen, president The arrangement is made possible by a system of loans to students to cover payments for tuition and maintenance, and has been put in effect to meet a widespread demand for extended payments for flying school courses

Hall Shipboard Fighter Developed

Has Monocoque Body With Flotation Features

BUFFALO (N Y)—With the primary aim of obtaining emergency flotation for the shipboard fighter type of service airplane, the Hall Aluminum Company, this city, in cooperation with the Bureau of Aeronautics, Navy Department, has developed the XFH-1 biplane The XFH-1 was built in Buffalo under the supervision of Lieut R D MacCart, resident inspector for the Bureau of Aeronautics, and F J Grenon, plant inspector for the Bureau at the Hall factory.

Two outstanding features are found in the design of this plane. The first of these is the watertight fuselage which is of monocoque construction built up of frames and stringers of unusual design and covered with aluminum alloy sheet Watertight bulkheads are built in and so located that flotation at reasonable trim is provided. The second feature is the means of releasing the landing gear when it becomes necessary to alight on the water

Powered by Wasp Engine

It would appear that these requirements would increase the weight of the plane but it has been found by the manufacturer that this craft is lighter than its prototypes which were built of steel tubing and fabric covered The plane is powered with a Pratt & Whitney Wasp engine, having a rating of 450 hp at 2 100 r p m

The XFH-1 has a wing span of 32 ft an overall length of 22 ft. 6½ in and an overall height of 11 ft 1 in The fuel capacity is 80 gal. and the oil capacity 6.6 gal The plane carries the full useful load and overload of the standard single seat shipboard fighter airplane Deck landing gear, bombing gear, fixed armament consisting of two guns, oxygen equipment, etc, are included in the installation

Additional Cleveland Exhibitors

CLEVELAND (OHIO)—Thirteen additional exhibitors at the National Air Races, this city, Aug. 24-Sept. 2, are announced as follows:

Fire Extinguisher Service Company, Cleveland, Hill Auto Body Metal Works, Cincinnati; Canton Drop Forge Company, Canton, Ohio; General Electric Company, Cleveland; Consolidated Aircraft Corporation, Buffalo, Andrew C. Campbell, Inc, Bridgeport, Conn; Invincible Metal Furniture Company, Manitowoc, Wis; Standard Steel Propeller Company, West Homestead, Pa, Ohio Seamless Tube Company, Shelby, Ohio; Scenic Airways, Inc., New York City; Brownback Motor Laboratories, Inc, New York City; Irving Air Chute Company, Inc, Buffalo, and Fokker Aircraft Corporation of America, New York City

S.A.E.-Aero Chamber Program is Announced

NEW YORK (N Y)—Program of the Joint Aeronautic Meeting of the Society of Automotive Engineers Inc and the Aeronautical Chamber of Commerce Inc, is announced here The meeting is to be held at the Hollenden Hotel Cleveland, Ohio, Aug 26-28, during the National Air Races

Fourteen papers are to be presented as follows 1 The Selling of Airplanes in Business Houses—Russell L Putnam 2 Wings—A Co-ordinated System of Basic Design—Ralph Upson, Aeromarine-Klemm Corporation, 3 The Autogyro—Juan de la Cierva, 4 Gaging Engine Performance—J H Geisse, Comet Engine Corp, 5 High Temperature Liquid Cooled Engines—G W Frank, U S Army Air Corps, 6 Geared Engines and Effect on Performance—Theodore P Wright, Curtiss Aeroplane & Motor Company, Inc., 7 Economic Relationship of Speed and Weight in Air Transportation—Edward P Warner, Editor of AVIATION, 8 Load Factors for Aircraft Structures and Load Tests vs Stress Analyses as a Basic Design Approval—Prof A S Niles, Leland Stanford University 9 Load Rating of Commercial Airplanes—W B Stout, Stout Air Services Inc, 10 Variable-Pitch Propellers—Frank W Caldwell, Standard Steel Propeller Corporation, 11 Variable-Pitch Propellers—Theodore P Wright, Curtiss Aeroplane & Motor Company, Inc, 12 Beryllium Alloys—H S Cooper, Beryllium Corportion of America, 13 Characteristics and Prevention of Corrosion of Strong Light Alloys—E H Dix, Jr, Aluminum Corporation of America, and 14 Welding Aircraft Parts—R M Mock, Bellanca Aircraft Corporation, former Technical Editor of AVIATION

Fix United-Sikorsky Terms

NEW YORK (N Y)—Terms of the offer to be made to Sikorsky company stockholders in effecting the acquisition of that firm have been approved by United Aircraft & Transport directors, it is stated here The terms provide for the exchange of stock at the rate of 5/13 of a share of United stock for each share of Sikorsky stock United's offer is conditioned upon the deposit of not less than 70 per cent of the outstanding Sikorsky stock The offer also provides for the exchange of outstanding Sikorsky options for options on common stock of United for a like number of shares Holders of approximately 70 per cent of the Sikorsky stock have already agreed to deposit

L. S. Starrett Reorganizing

ATHOL (MASS)—L S Starrett Company, tool manufacturer, this city, is arranging a reorganization which calls for the formation of Starrett Holding Corporation to take over its business Products of the firm include many precision tools used in the airplane industry

Hamilton Reports Propeller Exports

MILWAUKEE (WIS)—Hamilton Aero Manufacturing Company, this city reports recent shipment of propellers to Venice, Italy, Spain and Germany Those to Germany are to be used on a Dornier Wal four-engined plane being made for the Stout interests The Hamilton firm's production of an screws has been doubled since January

Order 12 More Commodores

BUFFALO (N Y)—According to reports here Consolidated Aircraft Company this city, has received an additional order for twelve Commodore flying boats, following an initial call for six such craft, from New York-Rio and Buenos Aires Airlines The first boat is promised by Sept 1

Border-Crossing Pilot Called Customs Violator

DULUTH (MINN)—J Warren Smith, pilot, was called before the local customs collector recently to answer charges as to why he failed to notify the customs authorities of his intention to land his plane here on his trip from Canada. For failure to report and have the plane inspected on arrival the pilot is liable for a $100 fine Another $500 fine is added for neglecting to surrender a copy of the manifest and obtaining a permit

Duluth is not designated a port of entry for planes and therefore it is necessary for pilots to secure permission before landing here Smith mentioned that he was unaware of the regulations and had no previous difficulties in his travels between the two countries but the testimony was forwarded to Washington, D. C, where a decision will be made, since it is the first case of its type to be questioned in this territory

Allied Aviation Acquires Royal

ST LOUIS (MO.)—Allied Aviation Industries Inc this city, announces acquisition of Royal Airways Inc, Madison, Wis, through an exchange of stock The Madison firm which operates an airport of about 450 acres will distribute the products of Allied Aviation and will enlarge its school John A Love, chairman of the Allied organization, a holding corporation of which Mono-Aircraft Corporation Aviation Accessories Corporation and Lambert Aircraft Engine Corporation are subsidiaries announces that the firm plans to acquire other companies in a general expansion of its system of distribution

American Eagle Adds Many Representatives

KANSAS CITY (MO)—Addition of 27 new distributors and dealers in the past 30 days is announced here by the American Eagle Aircraft Corporation E E. Porterfield Jr, president of the firm attributes this gain to the addition of the Wallace Touroplane and the firm's newly-developed Phaeton to the American Eagle line

Following is the list of new distributors and dealers

Arizona Airlines, Inc, Phoenix, Ariz, R H Cash, San Bernardino, Calif; Copper State Airways, Inc., Jerome, Ariz, B T Flannery, Chanute, Kan, Gottberg & Son, Columbus, Neb, Binghamton Flying Service, Inc., Chenango Bridge, N Y, Ozark Flying Academy, Siloam Springs, Ark J B Pundt Santa Barbara, Calif Roosevelt Motor Sales Company, Lombard, Ill, Yellowstone Airways, Inc, Billings, Mont; V U Young, Gary, Ind., Ray Schenck Clarinda, Ia, Puritan Air Transport Boston; Joel Stewart Grinnell, Ia Fred Oehler Coffeyville, Kan, Akron Airlines, Inc., Akron, Ohio, P G Stoneman, Willoughby, Ohio, F. G McMahon, Cleveland, Ohio, N E Keesling, Anderson Ind, J F Hall, Kirkwood, Ill, Great Western Air Sales Corporation, Tulsa, Okla.; Mutual Flyers Club, Inc, Lincoln, Neb, Ray Shiflett, Mangum, Okla., Kindred Aviation School, Enid, Okla, Rutledge Air Service, Inc; Central Montana Airways, Lewiston, Mont, and Frank E Crymble, Bangor, Me

Women's Derby Has 18 Stops

LOS ANGELES (CALIF.)—Eighteen cities between Santa Monica, Calif, and Cleveland, Ohio, scene of the National Air Races, Aug 24-Sept 2 are to be visited by the fliers in the Women's air derby to start from the West Coast Aug 18 according to late announcements concerning arrangements Cash prizes totalling $8 000, besides many trophies, are offered Entrants thus far are Marvel Crosson, Lady Mary Heath Amelia Earhart, Ruth Elder, Louise McPhetridge Thaden, and Bobbie Trout Overnight stops announced are San Bernardino, Calif; Phoenix, Ariz, El Paso, Tex; Wichita, Kan; St. Louis, Mo, and Columbus, Ohio. Intermediate stops are Yuma and Tucson, Ariz, Lordsburg, N M; Pecos and Midland, Tex; Tulsa Okla, Kansas City, Mo, and Terre Haute and Indianapolis, Ind

To Test Berliner-Joyce Plane

BALTIMORE (MD)—Berliner-Joyce Aircraft Corporation is to test its new plane within a few weeks The craft, a two-place American Cirrus powered cabin machine, is to be ready for display at the National Air Races, Cleveland A specially-constructed wing offering the best of visibility is announced as one of the features

Coast Group Assails Accident Sensationalism

SAN DIEGO (CALIF)—Feeling that newspapers and news reels sensationalize airplane mishaps, the San Diego Chamber of Commerce has sent a resolution to the National Aeronautic Association and the United States Chamber of Commerce with the request that these bodies undertake a national campaign to alleviate this condition The resolution follows

Whereas American newspapers, magazines and news reels in general make a practice of featuring and headlining all aviation accidents, making more or less sensational news of these occurrencies and,

Whereas, such display of these items in the newspapers, etc., creates an erroneous impression on the general reading public regarding the safety of aviation and

Whereas, investigation proves that the majority of the serious accidents in aviation are due to improper equipment or unskilled personnel or both and are not truly representative of the industry, now, therefore,

Be It Resolved, that the National Aeronautic Association be requested to immediately launch a campaign to prevail upon the various newspapers, magazines and news reels of the United States to publish news of aviation accidents in a less sensational manner, in such a way that all of the facts regarding the equipment and the personnel be given equal prominence with the fact of the accident itself

Drury Acquires C.T.A., Ltd.

MONTREAL (CAN.)—According to Trade Commissioner Sabine, this city, control of Canadian Transcontinental Airways, Ltd, has passed to the firm of Drury & Company, of Montreal It is understood that the latter firm is acting in behalf of the group of aeronautic companies headed by Western Airways, Ltd With bases at Quebec, St Felicien, Lake St Agnes, Quebec Province and Moncton, N B, Canadian Transcontinental owns seven passenger planes and operates a mail service from Rimouski to Montreal and Ottawa during the Summer and from Quebec to Seven Islands on the north coast of the St Lawrence, and from Moncton to the Magdalen Islands during the Winter

Kansas City Plans Tour

KANSAS CITY (MO.)—Intended to call attention to the development of aviation in Kansas City and to impress on smaller centers the importance of good airports, an air tour of seven states to last seven days has been arranged for the latter part of August by the local chamber of commerce Northwest and Southwest Missouri Iowa, Kansas, Nebraska Colorado Oklahoma and Arkansas are to be visited by the "Heart of America Tour," which is expected to attract some two score planes

Hawks and Collins Pathfinding

ROOSEVELT FIELD (L I, N Y)—Capt Frank Hawks, transcontinental record holder left here early this week in his Lockheed plane for a pathfinding tour to chart the route of the annual National Air Tour which starts from Ford Airport, Dearborn, Mich, Oct 5 Ray Collins, National Air Tour manager is accompanying Captain Hawks on the flight.

Complete Boeing "95" Order, Sell Three "100's"

SEATTLE (WASH)—The last of an order of 25 Model 95 mail planes has been completed by the Boeing Airplane Company, this city The planes have been sold to National Air Transport, Western Air Express, Pacific Air Transport, and Boeing Air Transport One of these planes, incorporating various experimental features, will be placed in transcontinental service by the Boeing Air Transport If these features meet with approval by the operating department, they will be included in the construction of Model 95 planes in the future

Sales of three Boeing, high speed, sport planes are also announced. Maj Clarence C Young chief of the Aeronautics Branch, is now flying a Boeing Model 100, which is the commercial design of the Boeing P-12, single seater Army pursuit plane The Boeing commercial sport model has a high speed of 165 m p h, a landing speed of 56 m p h, and is powered with a Wasp engine

Pratt & Whitney Aircraft Company has also taken delivery of a Boeing Model 100, while a motion picture company in Los Angeles has taken delivery of one of these speed planes, which will be used by the director in supervising an air film

Plan Eastern Russell Plant

SAN DIEGO (CALIF.)—Immediate expansion of the Russell Parachute Company by the establishment of an eastern factory and a nation wide chain of parachute service stations has been announced by H R McClintock, president With the eastern factory in operation, the firm will have three plants producing parachutes since the European trade is being supplied at the present time from the British Russell Parachute Company's factory in London the American trade being supplied from the factory here which is now completing a War Department contract calling for the construction of several hundred Army type parachutes

Standard Oil Survey in Utah

VERNAL (UTAH) — Standard Oil Company of California is preparing to make an air survey in the Uintah Basin of Utah employing one of the firm's Ford planes Data and pictures obtained will be used by geologists in studying the section in the interests of the concern

Universal Appoints Firm Flight Surgeon

ST LOUIS (MO.)—Dr Wade Hampton Miller, of Kansas City has been retained by Universal Aviation Corporation, it is announced by Paul Goldsborough, vice-president in charge of operations, as official company flight surgeon "Dr Miller will have direct charge of the health of all our personnel," states Mr Goldsborough "Under him, pilots and mechanics will receive complete examination—and overhauling if necessary—every 30 days, which is six times as often as the Department of Commerce requires"

The flight surgeon it is announced further, will study and make an analysis of industrial hazard in shops, dope rooms, and such, and see that any existing health hazards are eliminated He will supervise all safety factors and manage the sanitation of the entire system A comprehensive research in physical factors incident to flying in both pilots and passengers will figure prominently in his activities

Dr Miller is a rated flight surgeon, having graduated from the School of Aviation Medicine at Brooks Field, the Army school at San Antonio. He holds commission of lieutenant commander in Medical Corps, United States Navy Reserve, he has been flying for 16 yr, and has been active in aviation medicine since beginning of the World War Dr Miller holds both commercial and military flying ratings and is one of the first Department of Commerce examiners appointed following the Air Commerce Act enactment

Cited for Arresting Gear Work

WASHINGTON (D C)—Commendation of the Secretary of the Navy has been received by Licut Comdr. L C Stevens, of the Bureau of Aeronautics carrier section for work in connection with experiments conducted on the arresting gear test platform at the Naval Air Station, Hampton Roads, Va., and on the *Langley* and *Saratoga* for the purpose of developing a more efficient arresting gear for carrier decks and airplanes There has been invented, developed and placed in service a highly satisfactory type of hook, states the Bureau's *News Letter*, which has prevented a considerable number of serious casualties which had been for years accepted as inherent in carrier operations

Inland Announces Sales Policy

KANSAS CITY (MO)—Arthur Hardgrave, president of Inland Aviation Company, this city, maker of the Inland Sport monoplane, announces a sales policy in which the individual who plans to operate a plane for business or pleasure will be the primary marketing goal The Inland Sport has been under development for a year, with ten planes built in that time A factory for quantity production is to be erected at the Municipal Airport

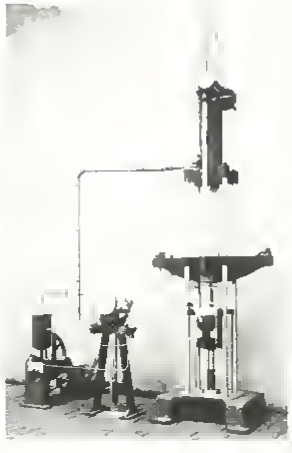
Martin Employs Amsler Machines

Used to Test Structure Of Fuselages and Hulls

BALTIMORE (MD)—In order to facilitate scientific study, Glenn L. Martin Company this city, has been conducting researches which require testing machinery of maximum precision and accuracy The first units of a series of apparatus especially adapted to the testing of shell structures to be used in fuselage and hull construction is comprised of Amsler testing machines imported from Switzerland

In addition to the 20 000 lb equipment, the Martin company has installed a 100,000-lb testing machine, the first of its type to be used by an aircraft factory and the second in this country, one being maintained by the Bureau of Standards, Washington, D C The Martin machine has a load sustainer which maintains the load over any given period, while at the same time tracing a visual record of the physical characteristics of the test specimen

The hydraulic precision testing machine is equipped for compression, transverse, bending, tensile hardness, shearing, and cupping tests In the Amsler machine the ram is fitted with such precision in the cylinder that there is only a slight leakage of oil between them This eliminates friction and allows exact measurements Further, the pendulum dynamometer, owing to its complete separation from the testing machine proper, is never subjected to shock, nor are any of the parts liable to be worn out Contrary to the method used in lever machines, which require great skill on the part of the operator to continuously balance the loads inserted during the tests by moving one or more jocky weights the operator of the Amsler machines has nothing of this sort to contend with for the dynamometer automatically balances the loads applied to the test pieces



The Amsler testing machine showing the separation of the pendulum dynamometer

Dynamometer has Four Scales

The pendulum dynamometer has four scales which correspond to one tenth, one fifth, one half, and the full capacity of the machine Having four load scales, Amsler machines can break with the greatest precision in load measurement, even the smallest test bars which break under loads amounting to about five per cent of the full capacity of the machine This feature is necessary to the precise testing of light metal alloys

An important arrangement is the pressure regulator which is fitted in the inlet-valve body This regulator keeps strictly constant the speed of the admission of the oil into the press of the machines no matter what load may be developed during the test of the machines and whatever may be the oil delivery of the pump The constant inflow of oil to the press is necessary for the correct recording of the diagrams connecting load with extension especially during the elastic period of the test pieces The speed of oil inflow can also be adjusted between wide limits The pressure regulator also allows a perfectly constant load to be maintained which is an important point in determining the modulus of elasticity This is extremely valuable as the design of modern aircraft structure requires careful attention to the relative deflection of all parts under load and an accurate knowledge of elastic distortions of material under load is essential

Five More Planes Approved

WASHINGTON (D C)—Five additional approved type certificates for air planes were issued by the Aeronautics Branch during the week ending July 27 They are as follows, according to model type, power plant, useful load and gross weight: No 176—Laird LCR-300 three-place open biplane, Whirlwind Nine, 1088 lb, 3010 lb; No 177—Cunningham-Hall PT-6, six-place cabin biplane, Whirlwind Nine, 1670 lb, 4350 lb, No 178—Alliance "Argo," two-place open biplane 115 hp Hess Warrior, 538 lb 1615 lb; No 179—Parks P 1, three-place open biplane, Curtiss OX-5 747 lb. 2078 lb; No 180—Timm Collegiate two-place open monoplane, Kinner K-5, 643 lb, 1952 lb

Champion Offers New Plug

TOLEDO (OHIO)—Production of a new spark plug for aircraft engines known as the Champion Aero A, the restricted bore construction of which enables application to practically all radial air-cooled engines as well as the more modern high compression water-cooled plants, is announced by the Champion Spark Plug Company this city Lower retail prices through increased production of aircraft plugs are also reported by the firm

Ask Army-Navy Status In Aerial Coast Defense

WASHINGTON (D C)—To clarify the relations of the Army and the Navy in the control of aerial coast defense, Secretary of the Navy Adams has asked the Attorney General for an interpretation of an amendment to the War Department appropriation act of 1922, on which the present modus vivendi is based This move resulted from a series of hearings held during May by Senator Bingham's special joint committee of Congress appointed early in the year Since strict confidence surrounds the action both of the committee and of the two departments, it is apparent that all parties concerned are attempting to avoid the bringing up of a public issue on the old fight for an independent air service.

It is not intended to change essentially the present organization, said Secretary Adams, when interviewed recently by a representative of AVIATION. In asking an opinion from the Department of Justice, he declared, the Navy Department simply wishes to place future developments in coast defense on a sound legal basis and does not seek to encroach upon Army jurisdiction

Specific action can not be predicted until the pronouncement of the opinion which is expected within the next few weeks One point under consideration is the status of shore based planes for over-water flying in coast defense organization However the ruling may touch upon broader questions such as the power of Congress over the internal set-up of the departments More definitely it will indicate the function of each branch of the service in the defense of the Panama Canal and of Pearl Harbor The decision also will clear up overlappings in authority as at San Diego

Quix Service Representatives

Some internal readjustments, however, may be recommended by later sessions of the committee So far the hearings have been closed and no stenographic record was taken Senator Bingham stated verbally that the Secretaries of War and Navy, the undersecretaries in charge of aeronautics, and various flying officers were called to testify The Army witnesses were quizzed as to the number of their bombers and bombing tactical units how much bombing practice their men had been given, etc Similar questions were put to the naval representatives.

The Joint Committee on Aerial Coast Defense includes Senator Bingham, chairman, Representative Taber, vice-chairman; Senators Reed, Hale, Fletcher and Swanson, and Representatives Ransley W E. Evans, Lea and Boylan

Arrow to Build Speed Plane

HAVELOCK (NEB)—Layout and drawings for an Arrow speed plane have been completed at the Arrow Aircraft Corporation plant, this city

S.A.T. Film Produced To Sell Air Travel Idea

FORT WORTH (TEX)—An educational film showing Texas from the air is being prepared here by Courtney Browne, moving picture photographer, for Southern Air Transport, Inc, Browne having flown over the air passenger lines operated through the state by Texas Air Transport, subsidiary of S A T. The film is to be shown in many theaters of the South and in a number of the schools

Much is done in the film to sell the idea of air transportation to those who view the picture Careful maintenance of S A T planes is shown as well as "shots" of the uniformed pilots, the process of buying airway tickets, etc

To offer an appeal to the younger generation, a simple story of a school boy who could not master his geography lesson is woven into the scenes Father and mother take the child over the Texas airlines and point out to him the various points of scenic, geographical, and historical interest

Great Lakes Amphibions Begun

CLEVELAND (OHIO)—Production of a twin-engined four-passenger amphibion plane has been started by Great Lakes Aircraft Corporation with three of the new type planes now being built. One will be flight tested Aug. 15 by Charles W Meyers, chief test pilot of the organization The planes will be powered by 115 hp Cirrus Hermes engines. They will be displayed for the first time at the National Air Races, Aug 24 to Sept. 2

Firm Seeks Saleswoman-Pilot

FORT WORTH (TEX)—Announcement is made here by Jack Yeaman general sales manager of Southern Air Transport, that a girl pilot is to be employed by the firm as an aircraft sales representative The position, to be open in about six months, asks the following qualifications: ability as a pilot, ability to speak before women's clubs, and personality to make contacts with newspapers and the public in general

Lambert Develops New Radial

MOLINE (ILL)—Lambert Aircraft Engine Corporation, this city, subsidiary of Allied Aviation Industries, Inc, St Louis announces development of a new five-cylinder radial air cooled power plant to produce 80 hp and to meet demands for a higher-powered plant than the firm's Velie M-5 Lambert is also bringing out an eight-cylinder inverted "V" type engine

Texhoma Offers Parts, Service

FORT WORTH (TEX)—A complete stock of parts and facilities for every type of service ranging from a complete over-haul on down are being included in the shop established at Meacham Field by Texhoma Aeronautical Service, Inc

S.A.T. to Offer Supply Catalog

FORT WORTH (TEX)—An aeronautical mail order catalog, listing some three hundred products of which it is agent, is being prepared here by Southern Air Transport, Inc The first catalog will be temporary, according to Jack Yeaman general sales manager, with a more complete issue planned to follow

Akron Company Finds Plane Good Investment

KANSAS CITY (MO)—Some proof of the earning power of airplanes as a sound business investment is given in the following story issued by the American Eagle Aircraft Corporation, this city:

"Six months ago, Akron Airlines, Inc., Akron, Ohio, purchased an American Eagle biplane, powered with a Curtiss OX-5 Used in taxi service, sightseeing hops and student instruction, the plane brought into the coffers of its owners an average of $1,000 a month

"Recently Akron Airlines sold the plane, receiving $100 less than the firm paid for the machine—and L C. Roundtree, president of the company, came to the American Eagle Aircraft Corporatioo's factory here for a new Eagle, this one Kinner powered"

More Offices for Universal

CLEVELAND, (OHIO)—Two more offices in the Terminal Tower Building have been leased by Universal Air Lines to take care of its traffic department At present the Cleveland-Louisville mail and passenger line and the air section of the Universal Aviation Corporation air rail transcontinental line are operated from the Cleveland airport

Viking Will Specialize In Building Flying Boats

NEW HAVEN (CONN)—Decision to specialize production in the flying boat field is announced by Viking Flying Boat Company, this city, incorporated in April to build flying boats and amphibions The firm has taken sole American license for the manufacture of boats from the designs of the French Schreck Company, which has been engaged in the production of such machines for a number of years.

General public participation in the company is not contemplated as the management has provided the necessary capital, but it is understood that Stearman Aircraft Company will own a minority interest in the concern

Officers and directors include the following: Robert E Gross, president and treasurer Reginald D Thomas, vice-president and general manager and Robert Proctor, secretary All the foregoing are directors as well as officers The following are directors only: Lloyd Stearman, Mac Short, Louis Schreck, Robert T Wilson, and Herbert G. Fales

Franklin Kurk, formerly of Bourdon Aircraft Company, will be in charge of engineering, while Prof Joseph Newell, of Massachusetts Institute of Technology and co-author with Prof A S Niles of a recent volume on airplane structures, will be associated with the company during the summer and will have charge of structural analysis of the Viking products

Reginald Thomas, vice-president, recently resigned from the United States Navy where he had a long experience with flying boats He was awarded the Schiff trophy in 1925 for flying 640 hours during that year without a mishap, a record exceeding that of any other Navy pilot for that period.

Emsco's New Tri-Engined Challenger Monoplane

PRODUCTION of planes is now under way at the new factory of the Emsco Aircraft Corporation, Downey, Calif, according to announcements. The first type of machine being built is the Emsco Challenger, shown in the accompanying photograph—a six-place cabin monoplane powered with three 170 hp Curtiss Challenger engines The firm also plans to build a four-engined plane of essentially the same design, a single-engined cabin monoplane, a two-engined amphibion, and a two-place sport monoplane The Emsco Challenger has a length over-all of 36 ft. a wing spread of 57 ft, and a height of 12 ft The first of this type has been sent on a tour of the country.

BRIEFLY

The Dayton Airplane Engine Company is reported to be in a position now to build ten Dayton Bear four-cylinder in-line air cooled engines daily.

Four sacks of mail were dropped successfully on the deck of the Leviathan recently on its way from Boston to New York in further air mail tests

The S 56 small three-place amphibion manufactured by the American Aeronautical Corporation under Savoia-Marchetti license, is being fitted with the Kinner 160 hp engine

New Orleans and Grand Isle are being linked by a week end service operated by Texas Air Transport, using a Travel Air monoplane.

An invitation has been extended to all pilots to use the Fagle Airport at Rocky Mount N C

Colonial Air Transport closed its third year July 1 with a record of having flown 501 506 mi and carried 131,-359 lb of mail

The Boeing System on July 26 completed 6 000,000 mi of flying over its Chicago-San Francisco and San Francisco-Seattle routes

An increase in traffic has followed Pacific Air Transport's (Boeing) reduction of fare rate to approximately $ 07 per mile.

The Boeing B-1 flying boat, built in 1919 a veteran of a good many thousand miles of flying recently was test flown and declared serviceable still Eight engines have been used in the plane during the 10 years

Southwest Air Fast Express flew 193 827 mi and carried 2 421 passengers in the period April 3 to July 3

A total of 1,641 passengers have been flown over the Grand Canyon in sightseeing trips since March 1 according to Scenic Airways officials

The Okay Airplane Company, Okay, Okla, has completed its first product, a two-place low wing Kinner-powered monoplane

Several initial flights were made recently by members of the newly organized Wichita Glider Club

Lambert Aircraft Engine Corporation, Moline, Ill has developed a new five cylinder radial engine and is said to be developing an eight cylinder inverted "Vee" type engine

According to Walter Wright superintendent of the Chicago Municipal Airport 1 429 planes arrived and 1 452 planes departed from the port during the week ending July 20

Nick Mamer, of Spokane, Wash., is reported planning to attempt a transcontinental non-stop refueling flight this month

N A A officials are awaiting confirmation of a report that women's records are to be placed in a special category by the Federation Aeronautique Internationale

Curtiss Flying Service is to operate an amphibion service between New York and Saratoga and Lake George during August

The McCook (Neb) *Daily Gazette* has bought a cabin plane to transport newspapers over a 300 mi route beginning about September 15

Thompson Aeronautical Corporation is to lease the $125 000 hangar being erected at Cleveland Municipal Airport by The Austin Company

Washington Aircraft & Transport Corporation, of Seattle Wash has received a car load of Davis V 3 monoplanes

Baker-McMillen Company Akron Ohio, is expanding its plant for the manufacture of gliders

Plans are being completed for the first Nebraska Air Tour, September 8-14

A Lincoln, Neb, chapter of the N A A has been formed.

Representatives Named

Fleet—Yellow Cab Airways, Des Moines, Ia, for the state of Iowa

Von Hoffmann Aircraft Company, St Louis

Avian Stinson Jr Leblond—Von Hoffmann Aircraft Company St Louis

Curtiss Flying Service—Strikland-Williams Flying Service, Tampa Fla

Walter M Murphy Aircraft Company, Los Angeles, Calif, for southern California

Universal Aviation Corporation for twelve Central West states

New Standard—Colonial Flying Service, for New England

AERONAUTICAL CALENDAR

Aug. 24-Sept. 2	National Air Races and Aeronautical Show Cleveland Ohio
Aug 26-28	Joint Aeronautic Meeting of the Society of Automotive Engineers and the Aeronautical Chamber of Commerce Hollenden Hotel Cleveland
Aug. 27 28	Second meeting Western States Aeronautic Association Salt Lake City
Sept. 2-7	Class C Aviation Exhibit Rochester Exposition at Rochester, N Y
Sept. 6-7	Schneider Cup Race over the Solent Cowes England
Sept 23-28	Fourth Annual New England Aviation Exposition, Boston Garden, Boston Mass
Sept. 28	Gordon Bennett Balloon Trophy Race St. Louis, Mo
Oct. 5-21	National Air Tour, Starting from Ford Airport, Dearborn Mich
Oct. 12-27	Southwestern Aircraft Exposition, State Fair Grounds Dallas, Tex.
Oct 24-25	Conference on Municipal Airports at Washington D C under auspices of the American Road Builders Association
Nov 18	Lehigh Airport Design Competition closes Lehigh Portland Cement Company
1930 February	National Air Show auspices Aeronautical Chamber of Commerce, St. Louis
Feb 5-12	New York Aviation Show auspices Aviators Post, American Legion
April 5-13	All American Aircraft Show, Detroit
May 3-10	New York Aircraft Salon auspices Metropolitan New York Division, Distributor-Dealers Section Aeronautical Chamber of Commerce, at Madison Square Garden, New York City

New Firms Announced

Rutledge Air Service Ltd, Calgary, Alberta, Canada Lieut. W. L Rutledge, who has been pilot-instructor of the Calgary Aero Club, is director and chief instructor, to carry on commercial flying and instruction

National Air Express, Inc, 58 Congress Street, Troy, N Y, capital 1,000 shares no par value stock, by Harry S Carleton, Edgar H Buck, John A Newbitt, to operate aircraft and conduct an aviation school.

Ace Aircraft Manufacturing Corporation Wichita Kan capital 25 000 shares no par value stock by Gov. Clyde M Reed, Henry J Allen George H Siedhoff, O G Corben, C A Noll, Hal M Black and Arnold C Todd to manufacture aircraft

Adirondack Hudson River Air Lines Inc, 15 Broad Street, New York City, capital 100 shares no par value stock, by Murray D Welch, Russell E Sumner and William S Savage, to operate aircraft

Columbia County Airways Corporation, Hudson, N Y, capital $25,-000 by John M Benson, Ray L Foster and Edward M Van Aken to deal in aircraft.

Air Shares, Inc Milwaukee Wis, by Clyde Hudspeth, Hans Herzfeld, John Leckley, Elling O Weeks of the Weeks Aircraft Corporation and Fred Pabst, Jr of the Pabst company

Aviation Engineering Corporation, 225 West 57th Street, New York City capital $250 000 to manage airports and to manufacture the Red Bird airplane

Mercury Aviation Corporation, has been chartered in Los Angeles, Cal, capital 50,000 shares of no par value stock by J Banner Bunch, A B Strayer, T. J. Jarvis and H. W Yarick

Rankin Airplane Sales Company, Portland Ore, capital $10,000 by W H Cullers and N C Bowles

Gettberg Aviation Company Columbus Neb capital $100 000 by John F Gettberg Max F Gettberg, Grover Lang and Oscar Gettberg

Tyrrell's Service Inc Yakima, Wash, capital $50 000 by G McNeil, P C Land and others to service airplanes and automobiles.

Walla Walla Airplanes Inc Walla Walla Wash capital $50,000, J A Kinnear and H E Roche

Fay Mott Aero Corporation Huntington Park Calif 10 000 shares no par value stock Chester Mott, Victor S Larson and H M Larson

The Aircraft Plywood Corporation Seattle Wash J L Peters A H Gould E. C Metzger and J C Sams to manufacture plywood for aircraft

Southern Airways Inc Chapel Hill N C capital stock of $50 000, Yawger Pickell J. E Burroughs and C E Martindale to conduct a flying school and other aviation activities

PERSONNEL

William Atwell chief pilot for the Dingan Airways Inc, and Ralph De Palma, noted automobile racer, have been elected honorary officials for the National Air Races in Cleveland, August 24-September 2,

Mrs Dewey L Noyes, of Cleveland, has been appointed sales demonstrator for the Curtiss Flying Service of Ohio, Inc

Edward H Sharpe, assistant manager of the development and colonization of the Southern Pacific Company, has resigned to become public relations director for The Aviation Corporation New York City,

Judge Philip A. Roll, Fort Meyers Fla., has been made pilot for Airways Transport Company of that city

Fred Schwaemmle has been appointed operations manager of Pitcairn Aviation at Miami, Fla, succeeding George E Chambliss, who has been made Pitcairn shop manager at Philadelphia. Eddie Ballough, of Daytona Beach, has been appointed to succeed Schwaemmle as mail pilot

Judge Byron K Elliott of Superior Court, Indianapolis, has been elected president and director of Curtiss Flying Service of Indiana, Inc

T Lee has been appointed general manager H F Lusk, dean, and George Meyers, veteran mail pilot, as chief, of the flying service of the Boeing School of Aeronautics to be opened at Oakland Calif., September 15 All three have had Army experience before engaging in commercial aeronautics.

Blaine Stubblefield has been appointed publicity manager for Air Investors, Inc He was formerly with the Boeing Air Transport as publicity manager

Claud A Herrick has been selected manager of the Wilkes-Barre Wyoming Valley (Pa) Airport S L Underwood is chief pilot there

S L Willits, formerly assistant chief of inspection, Aeronautics Branch has been made the vice-president of the Spartan Aircraft Company Tulsa, Okla.

Robert E Lees sales manager of the Waco Aircraft Company, Troy Ohio has been elected member of the board of directors He will continue as sales manager

Fred J Fisher C F Kettering and C. E Wilson have been added to the board of directors of the Fokker Aircraft Corporation of America representing the General Motors Corporation which has controlling interest in the aircraft manufacturing concern

A J Edwards recently resigned as general manager of the Swift Aircraft Corporation Wichita Kan has been named sales engineer of the Metal Aircraft Corporation Cincinnati Ohio He formerly was manager of the B F Mahoney Aircraft Corporation, of San Diego

O Ferguson C S Fisher C C Flagg and Lieut L W Roberts, have joined the Nicholas-Beazeley Airplane Company, Marshall, Mo The first two are on the sales staff and the others will serve as chief inspector of the manufacturing division and engineer, respectively

Arthur W Spence has been named general manager of the Halley Aviation Management, Inc., Rapid City, S D

James C Calvert who was formerly a member of the editorial staff of the Ft. Worth Tex, *Star-Telegram*, has joined Bramff Airlines, Inc., as public relations representative in Ft Worth and Dallas He will also be a special traffic representative in Ft. Worth

J A Russell, who was formerly with Pan American Airways, Inc has become the traffic representative of Universal Air Lines His headquarters are in Chicago

Larry Harris, former operator of aviation schools at Nashville Tenn, Bowling Green and Hopkinsville, Ky, has been named chief pilot and instructor for Interstate Airlines, Nashville

Reed Lanois has become the advertising agent for Interstate Flying Schools, conducted by Interstate Airlines Inc, Evansville, Ind

J G "Tex" Rankin. Lieuts F E Garbutt, Basil B Smith, A. B McKenzie and Archie Roth have been appointed members of the Oregon State Board of Aeronautics by Governor I L Patterson

Brig Gen. William E Gilmore who was formerly in command of the material division at Wright Field, Dayton, O, has been made assistant chief of the Air Corps, U S. Army

Lieut W W Gross and Lieut Faederick W. Ott, have been granted leaves of absence from the Air Corps to engage in cotton dusting work with Wings, Inc Shreveport La

Lieut Homer E Fackler, of the new Standard Flying Service, Inc has been appointed demonstration pilot by the New Standard Aircraft Corporation

Joseph G. Hardy has joined the engineering staff of Ryan Aircraft Corporation

Wilson Reeo has been appointed assistant meteorologist at the Cleveland Municipal Airport

Ernest E Bashom, pilot of the refueling plane on the Cleveland endurance flight has resigned as mail pilot on the Cleveland Buffalo run of Colonial Western Airways to become chief pilot for the Stewart Aircraft Corporation Cleveland.

H E Cassidy has been appointed director of sales research and publicity of the Avelson Aircraft Engine Company Los Angeles

W T Whalen vice president and general manager of the General Motors Export Company has been appointed vice-president and general manager of the Fokker Aircraft Corporation of America

Joseph W Sabin formerly with the Continental Division of Universal Aviation Corporation has been named general passenger agent for the corporation, and George A Specht, formerly regional passenger agent at Chicago has been named assistant general passenger agent. They will both be located at St Louis

John Johnson formerly inspector at the Fokker plant at Wheeling W Va has been appointed chief of airplane and engine mechanics of Universal Aviation Corporation

Jay R O Connell has been appointed regional sales director of the Curtiss Flying Service for Ohio and Kentucky O Connell was a World War pilot

L A Bichlmeier, associated with the American Eagle Aircraft Company, of Kansas City, Mo since its organization four years ago has become manager of Hanford's Tri-State Air Lines Company of Sioux City, Ia., succeeding Wilbur D'Alene

TRADE TIPS

It has been reported that

With the exception of the manufacturing unit of the Pratt & Whitney Aircraft Company's new plant at Hartford, Conn, bids are about to be asked for the construction of the main buildings

Whitehall (N Y) Chamber of Commerce has launched a campaign for subscriptions to construct a modern airport on a site one mile east of the city

A seaplane base to include four hangars, repair shops and a passenger station will be built at Tampa, Fla., by American International Airways and New York, Rio & Buenos Aires Lines.

C Franklin Wheeler, builder of the Fort Myers (Fla.) Airport, is in the market for a plane

[Attention is called to trade information included in the Airport Construction column and miscellaneous items.—Editor]

Schools and Colleges

Boston Trade Schools are to include courses in aircraft repairing in their curricula

Great Western Air College has been planned by T J Chastin of Tulsa, Okla, and his associates, J P Key, E. W Skarke and C B Polk

Parks Air College has opened a ten weeks' course in aircraft welding. Payment of tuition on the installment has been arranged at the Parks School

Hower Vocational School, Akron, Ohio, is to include a course in aeronautics

Cleveland Institute of Aeronautics is to start operation August 5 in its new $100 000 hangar.

Black Hills College of Aviation has installed a course in aviation law pertaining to the ownership and operation of aircraft

Midland College Fremont Neb, a Lutheran institution is including a course of aeronautics in its curriculum

AIRPORTS AND AIRLINES

Stout D. & C. Line To Begin This Month

CLEVELAND (OHIO)—Service on the Detroit-Cleveland Buffalo route of the Stout D. & C. line is to start about the middle of this month, A. A. Schantz, president of the Detroit & Cleveland Navigation Company, has announced. Two Dornier Super-Wal flying boats each powered by four Hornets, are to be used.

In announcing the opening date of the line, Schantz revealed that a 100-passenger Dornier flying boat similar to the Dornier DoX plane recently launched at Lake Constance, Switzerland, may be used on Lake Erie next summer. Negotiations for the purchase of one of these planes are progressing.

Charles D. Williams, representative of the company, is at Lake Constance, inspecting trial flights of the 100-passenger Dornier.

The two Dorniers to be used this summer were shipped from the German factory at Friedrichshafen in July. They will be reassembled at Philadelphia and tested for government license. The planes will then be flown to Detroit to open the new lake line.

The Dornier boats will be operated on the lake until about October 15 when it is probable they will be taken to Norfolk, Va., for service on a proposed Norfolk-Miami, Fla., line this winter.

The four-engined planes to be used here have a top speed of 150 m.p.h. They have a speed of 45 m.p.h. on the water. The planes each weigh 17,160 lb. and are capable of carrying a useful load of about 15,000 lb.

Fifty minute service between Detroit and Cleveland and 90-min. service between Cleveland and Buffalo is scheduled for the line. Buffet meals will be served aboard the plane.

Glen H. Hoppin is in Cleveland selecting a site for the local terminal of the line at the foot of East Ninth Street in the downtown district.

Open Maywood Radio Unit

CHICAGO (ILL.)—The radio station at Maywood, Ill., has been placed in commission and with its operation the Government's full weather communication facilities on the New York-Chicago airway have been completed. With the recent inauguration of the radio beacon station at Goshen, Ind., beacon service over the entire airway was made available. This service will be extended westward from Chicago to Omaha by the opening early this month of the new stations now building at Sterling, Ill., and Des Moines, Ia.

Universal to Equip Airway

ST. LOUIS (MO.)—The air route between Great Bend and Garden City, Kan., on the transcontinental air-rail line of the Universal Aviation Corporation, will be lighted for night flying, it is announced here. A radio-beacon station is to be erected at Garden City and beacon towers will be installed at intervals of about 10 mi. The lighted airway is expected to be completed about September 1.

Large Group Plan Air Express Service

NEW YORK (N.Y.)—Development of air express on a large scale is to be undertaken by a number of the leading eastern aeronautical interests. Full reports of the plan will not be released until the return soon of C. M. Keys, head of the Curtiss Keys group, but so far the following have been named in connection with the project: National Air Transport, Curtiss-Wright Corporation, Transcontinental Air Transport, and the banking houses of James C. Willson & Company and Blair & Company.

One of the uncertain aspects of the plan, according to the information so far available, is the relation between this new air express service and the American Railway Express. It is expected that the two will function in co-operation however. The latter has been promoting air express through contracts with many of the air mail contract operators, N.A.T. being the first to be included in this arrangement. Another reason making co-operation likely is the existence of the latter's extensive ground service and organization.

The new company may be operated under the name of United Air Express, an outgrowth of the United Parcel Service Company, which was acquired recently by purchasers understood to be the two banking houses mentioned above. The service would be expanded to be practically nation-wide. New financing will be undertaken to promote the plan and the complete scheme is expected to be announced soon.

Name Three Airports of Entry

WASHINGTON (D. C.)—Three additional airports of entry have been named. The trio includes the Ford Airport, Dearborn, Mich., the Grosse Isle Airport, Detroit, Mich., and what is called the Canadian Gateway Airport at Newport, Vt. The Ford Airport is selected on a temporary basis pending the reconstruction of the Detroit Municipal Airport. The Newport, Vt., Airport is to serve as a point of clearance for the New England states.

Guggenheim Urges Extending "Model" System

NEW YORK (N.Y.) — The Daniel Guggenheim Fund for the Promotion of Aeronautics strongly recommends that the government extend the weather reporting system worked out in the year's experimental operation of the Guggenheim model airway between San Francisco and Los Angeles to other airways. This was contained in the Fund's report of the year's work, which has been declared a valuable contribution to the development of aviation meteorology.

The Fund has believed adequate weather reporting service is one of the most promising solutions to safe aircraft operation. To demonstrate this contention it has operated at its own expense (about $60,000) and in co-operation with the government and Pacific Telephone & Telegraph services, the model airway. That particular airway was chosen as representing the best cross-section of general airway conditions.

Considerable data about aviation weather reporting was accumulated and claims of success are borne out by the fact that the system has been taken over by the Aeronautics Branch (July 1, 1929) and will be copied in various forms in the development of other airways. Furthermore not a single accident on that airway was attributable to weather was reported during the year.

[Many are already familiar with the model airway. Those who desire complete or additional information are referred to the pamphlet "Weather and the Airplane" by Edward H. Bowie, meteorologist serving on the airway, which describes the year's work. It is published by the Fund.—Editor.]

Pitcairn Makes Changes

PHILADELPHIA (PA.) — Pitcairn Aviation, Inc., has announced a new service on the Miami-Atlanta section of the New York-Miami airway and the change of offices on July 31 from the Land Title Building here to the Sperry Building, Manhattan Bridge Plaza, Brooklyn. The new service will give seven days per week operation over the Atlanta-Miami line as is being operated already over the northern section. The change of office follows the recent acquisition of the concern by North American Aviation through C. M. Keys.

S.A.F.E. Starts Package Service

DALLAS (TEX.)—Express service for small packages on passenger planes of Southwest Air Fast Express has been inaugurated. The rate is $0.01 per mile per lb.

W. A. E. Shows Big Gain in Revenues

LOS ANGELES (CALIF.)—That gross revenues for 1929 are likely to nearly double gross figures for 1928 is the deduction gained from study of the report of Western Air Express, Inc., covering the first six months of the present year. Gross revenues derived from mail, passenger and express services aggregated $1,173,064.91 for the six months ending June 30, as compared with revenues of $1,348,482 for the entire year 1928.

No statement was contained in the W.A.E. report regarding operation expenses and profits, but officials stated that the net earnings available for dividends on common stock were substantially ahead of the corresponding period of last year.

Gross revenues from mail contracts reached a total of $1,043,156.61 for the six months period 1929. Total mail revenue for 1928 was $1,208,866.05. Total mail carried during this same six months period amounted to 380,739 lb. as compared with 111,434 lb. for the first six months of 1928, a gain of nearly 250 per cent. Gross passenger revenue for the six months was $127,035.36 with 8,019 passengers carried.

The number of miles flown during the first six months of 1929 totaled 747,632. Thirty-one planes are now operating by Western Air Express as against thirteen last year.

Shreveport Gets Line To New Orleans

SHREVEPORT (LA.)—The establishment of a semi-weekly passenger air service from New Orleans to Shreveport beginning July 28 has been announced by officials of the Weddell-Williams Air Service, Inc., of New Orleans.

The schedule is: South bound, leave Shreveport 2:30 p.m., Alexandria 3:45 p.m., Baton Rouge 4:46 p.m., and arrive at New Orleans at 5:20 p.m. Northbound, leave New Orleans 8:30 a.m., Baton Rouge 9:16 a.m., Alexandria 10:17 a.m., and arrive at Shreveport at 11:30 a.m. The fare is $30.

[Other services operated by this company are described on page 243, issue of July 27.—Editor.]

To Start Airway to Capital

WASHINGTON (D. C.)—Construction of a lighted airway between Washington and Pittsburgh will be under way by September 15, it was announced at the Airways Division of the Aeronautics Branch recently. Surveys of prospective landing fields and beacon sites have been practically completed, it was stated. Bids for the actual work of construction will be asked during the next few weeks and the work will be commenced immediately after the contract has been awarded. Bids for air mail service over this route have not yet been asked but it is believed this will follow in a short time.

Mail Averages 42 Hr. to Coast

SAN FRANCISCO (CALIF.)—An average elapsed time of 42 hr. 32 min. for the coast-to-coast mail service on the Night Transcontinental operated by Boeing and N.A.T., has been reported for the month of June. The report was based on a study by Boeing. An unfavorable factor was the June flying weather considered abnormal on account of considerable fog. Account should be taken, also, of the westbound trips, which are handicapped by headwinds. The route is scheduled to be flown eastbound in about 32 hr. and westbound in about 34 hr.

Mason & Dixon Starts Detroit-Cincinnati Line

DETROIT (MICH.)—Daily passenger service between Detroit and Cincinnati was to be inaugurated Monday, July 22, by Mason & Dixon Air Lines, Inc. There will be two planes daily from each point.

The line was informally opened July 20, with four seven-passenger Wasp-powered Flamingos.

Planes will leave Detroit and Cincinnati at 8:45 a.m. and at 4:45 p.m. daily, according to the schedule. The trip takes approximately 2 hr. 39 min. The fare between the two cities is $30, or $0.12 per mile.

The operators plan to extend eventually the line to Atlanta, Ga., with stops at Lexington, Ky., and Knoxville, Tenn. The Ford Airport at Dearborn, Mich., and the Lunken Airport are the Detroit and Cincinnati terminals of the present line.

E. V. Savage, president of the Mason & Dixon Air Lines, is now negotiating with officials of the Louisville & Nashville Railroad for an air-rail service between Miami, Fla., and Detroit. Present plans call for a transfer of train passengers from Miami to planes at Atlanta, fly them to Nashville where they will again board a train for Cincinnati. There they would board planes and finish their journey by air to Detroit.

Standard Gets Fokker F-10's

LOS ANGELES (CALIF.)—Two tri-engined F-10 Fokker transports were flown to this city recently by Jack Frye, president, and Paul Richter, vice president, of the Aero Corporation of California. The new planes will be placed in operation at once on the Standard Air Lines route between Los Angeles and El Paso, Tex. Aero Corporation will take over the old planes.

Pickwick Subsidiary Starts Mexico Line

LOS ANGELES (CALIF.)—The Pickwick Airways, Inc., of Los Angeles, Calif., has announced the acquisition of the properties and contracts of the Latin-American Air Transport Company of Mexico City. About $3,000,000 was involved in the deal, according to Thomas F. Morgan, vice president and general manager of the Pickwick organization.

On August 1 the company was to begin a thrice weekly passenger, mail and express service linking Los Angeles with Mexico City and Guatemala.

Chief among the contracts transferred to Pickwick Airways, Inc., by the deal, Mr. Morgan asserted, are an air-mail contract awarded by the Mexican Government March 15 last, a two year option on this contract; a contract in the form of a 20-year franchise obtained in November, 1928, to carry passengers and express through Mexico by the West Coast route to Guatemala; and a contract with the Republic of Guatemala for carrying mail, passengers and express in and through that country.

The new service will be operated under the name of the Latin-American Air Transport Company with headquarters in Los Angeles. It will put in the air a supplementary fleet of six ten place Wright engined cabin planes and add 2,700 mi. to Pickwick's flying service. The tentative schedule calls for planes to leave Los Angeles every Monday, Wednesday and Friday, the proposed route including Tia Juana, Mexicali, Nogales, Hermosillo, Guaymas, Mazatlan, Tepic, Guadalajara, Morelia and Mexico City.

Following inauguration of the service to Mexico City, the line will be extended on August 8 to Guatemala City. It is the plan of the company to extend this new service to Salvador and Panama. The route has been surveyed by Pickwick officials in two Fairchild planes via Mexico City to Guatemala.

Plan New Wisconsin Mail Line

MADISON (WIS.)—A movement to establish a new air mail route through central Wisconsin was begun here at a recent meeting of postmasters and civil officials. The route to have its northern terminal at either the Twin Cities or Duluth, would run through Eau Claire, Wausau, Wisconsin Rapids, Port Edwards, Nekoosa, Madison, Janesville, Beloit and Rockford, Ill., terminating at Chicago. W. R. Dalton of Nekoosa was appointed chairman of the committee.

Fence for Safety at Columbus

COLUMBUS (OHIO)—To prevent injury to persons who have been crowding Port Columbus since inauguration of the T. A. T. air-rail service it has been necessary to construct a fence 108 ft. long between the administration building and the taxiway.

AIRPORT CONSTRUCTION PROJECTS

Sanders Air Service Inc., has leased a 145x200 ft track at the Los Angeles Metropolitan Airport and will build there a steel and cement hangar and offices large enough to house 25 planes Asphalt runways 3,500x300 ft are being installed at the United Airport which is being built by the Boeing System to serve both Los Angeles and Burbank It will be a six-way field

Work is being rushed on the construction of a hangar at Cheyenne Wyo by the Boeing System in anticipation of the inauguration of 18-passenger tri-engined transport service between Oakland and Chicago. Twenty new floodlights and projectors, producing a total of 50,000,000 candlepower have been installed at the Grand Central Air Terminal, Glendale, Calif.

Work has begun on the grading, draining flood control soil conditioning soil treatment, seeding, buildings and water supply system for the Chattanooga (Tenn.) Airport Bids will be opened soon for lighting. The $250,000 appropriated for this is under the supervision of Benjamin King & Associates, of Washington D C

Boston Building Advances

At the Boston (Mass.) Airport interior furnishings are being applied to the Curtiss and Skyways hangars The steel frame is nearly all up for the Colonial Air Transport hangar and brick work and pressed steel is in position for the East Coast Aircraft Sales, Inc., building This concern also is directing a 60x80 ft steel hangar at Muller Field Revere, Mass

Construction of an overhaul and repair shop for the Minneapolis (Minn.) aviation unit of the United States Naval Reserve is rapidly nearing completion at the Wold-Chamberlain Field Fort Meyers, Fla., has added a third runway to its L-shaped field and is building a steel hangar Actual construction of the Duluth (Minn.) Municipal Airport is under way

One mile of the two miles of bulkhead required to surround the fill at Dundalk—Baltimore (Md.) Municipal Airport—has been built About 2,500,000 cu yd of material of the 12,000,000 necessary to complete the job have been placed in the fill already The Oakland Airport Inn, costing $55,600 and providing 37 rooms, has been completed and is in use

Three hangars and the administration building of the Curtiss Flying Service and the Universal Aviation Corporation at Fairfax Airport, Kansas City, were to be completed early this month Another building for the storage of planes and including salesrooms is expected to be ready in September The foundation work for the new administration building, due to be completed in October is under way.

Work has been started on the airship dock being constructed by the Goodyear Tire & Rubber Company at Gadsden Ala The building will be 200 ft long 75 ft wide and 75 ft. high It was designed by Wilber Watson and Associates, Cleveland, Ohio According to plans, it should be completed in the middle of August The new $8,000 administration building is being completed at the Colorado Springs (Colo.) Municipal Airport.

A drive for construction of a seaplane base at the lower end of the western side of Manhattan, New York City is being considered by the Lower Manhattan Industrial Association This would provide a landing place close to the Wall Street area The plans prepared by B Russell Shaw Company, St. Louis for the improvement of Kinsolving Field at Abilene, Tex., have been approved and construction is to start early this month A steel and concrete hangar will be the first item of construction.

Curtiss Plans Announced

Plans have been completed by Kenneth Franheim, of New York City for the new Curtiss 325 acre headquarters field at Valley Stream, L. I. When completed the plant will include a combined administration building and casino, a repair base, six hangars, a dope and engine shop, a cafeteria, two exposition buildings and a complete flying school The runways will measure 2,900, 3,000, 3,500 and 3,600 ft in length There will be parking space for 10,000 cars elaborate landscaping will be developed, lighting and radio facilities will be installed.

Contract for the new $7,400 service hangar at the Milwaukee County Airport has been let The Virginia (Minn.) Municipal Airport is expected to be ready August 15. Three of the runways will be 2,500 ft. long and fourth to be 3,000 ft. long. Approximate cost is $40,000

Developing Maryland Port

Drake Construction Company has started work on Universal's $80,000 hangar at Cleveland to be used exclusively in flying school work Development of what is to be known as Belvedere Park Airport has been started near West Palm Beach, Fla. Under the auspices of the Maryland Airport Corporation a 100-acre airport is being developed at Cumberland, Md., and an administration building and lunch room have been completed Construction was done by the Airport Development and Construction Company of Philadelphia Among those in the Maryland Airport Corporation are Ray Krimm, James C Shriver, John G Wiehel, N R Krimm and others

Extensive development of the old army field at Americus, Ga., is to be undertaken by Sumpter County officials who recently acquired the property from the government A flying school is among the developments planned The Thompson Aeronautical Corporation of Cleveland will add a 75x150 ft extension to its hangar at Cleveland, Ohio The Austin Company will do the work, according to the present expectations

The new Montgomery, Ala., Municipal Airport is nearing completion and is expected to be ready for service within about two months The tract comprises 1,000 acres with a maximum grade of 1 per cent. It is operated by the Montgomery School of Aeronautics The plant includes: A brick and steel hangar 150 ft. x 150 ft.; a club house dining room and dormitory of brick and steel 75 ft. x 32 ft.; a large administration building three stories, 30 ft. x 40 ft. brick and steel; a large automobile service station and a brick and steel work shop 25 ft. x 150 ft

Western Air Express has started construction of an airport at Alva, Okla., on its Kansas City-Los Angeles line

Preparing Cleveland Airport for Races

CLEVELAND (OHIO)—The $400,000 improvement program to put the Cleveland Municipal Airport in condition for the National Air Races August 24-September 2, is being rushed to completion. The work includes grading, which involves moving 30,000 cu.yd. of earth, the laying of 10,000 ft. of drain piping and surfacing of runways

Another $50,000 is being spent on a grandstand accommodating 30,000 persons, a large central race administration building a contest technical station Red Cross stations and headquarters building for the Army, Navy, Marine Corps and National Guard units. The main building will be of four stories, 66x22 ft This will provide quarters for all the race committees and officials broadcasters, the press etc., even to a dark room for the photographers.

Modify Air Chart Program

WASHINGTON (D. C.)—The Hydrographic Office, Navy Department, has modified its aviation chart program Aviation, charts of the east and west coasts of South America will take precedence over those for the west coast of Mexico from Punta Arenas northward to Rosario. The increasing demand for aviation charts of South America and the lack of aviation activity along the west coast of Mexico area has made this change advisable. An additional chart—Managua, Nicaragua, to Tela, Honduras—has also been added to the program

Canadian Firm Launches Line

MONCTON (NEW BRUNSWICK)—International Airways of Canada Ltd. has launched its passenger service between this city and Charlottetown Prince Edward Island. Trips are made daily, except Sunday, with the machine leaving here at 10:45 a.m. and arriving at Charlottetown at 11:45 a.m. The plane leaves Charlottetown at noon and arrives here at 12:40 p.m. The fare one way is $15 and round trip $25

Airway Construction Advancing Rapidly

WASHINGTON (D. C.)—Taking advantage of summer and the favorable weather which has predominated in many sections the field agents of the Aeronautics Branch are making extra efforts to advance the work on Government airways According to latest reports, construction of beacons and intermediate landing fields on four airways is nearing completion and construction is about to start on four additional routes

The latest report states

Buffalo-Albany section of the Cleveland-Albany airway Work is progressing rapidly on this section more than half of the towers have been erected also three beacons

Chattanooga-Nashville section of the Atlanta-Chicago airway Work is progressing steadily All but two towers have been erected

Evansville-Lafayette section of the Atlanta-Chicago airway Installation of lighting equipment on this airway is practically completed with the exception of course lights which are awaiting inspection before shipment.

Indianapolis-Dayton airway Work is progressing rapidly All towers excepting one have been erected and the lights are expected to be in operation on scheduled time

Michigan airways Equipment is being delivered and actual construction work will start soon

Milwaukee-Green Bay airway Contractors materials are being delivered and construction work will be started soon

Redding-Roseburg and Roseburg-Portland sections of the Los Angeles-Seattle airway Lighting equipment is being delivered and actual construction work will start in a few days

Waco-Fort Worth airway Contractors materials are being delivered and construction work will be begun within a few days

Chicago and Dallas Linked by Air-Rail Line

FORT WORTH (TEX.)—An air-rail hookup was to be inaugurated August 1 by Southwest Air Fast Express and the Illinois Central Railroad providing a 17 hr. schedule between Chicago and Dallas

Northbound passengers leave Fort Worth or Dallas on the S.A.F.E. plane for St. Louis, where they transfer to the train The S.A.F.E. line includes stops at Oklahoma City, Tulsa, Wichita, Kan. and Springfield, Mo

An air-rail hookup between Standard Airlines and the Texas & Pacific Railroad has connected Dallas and Fort Worth with 27 hr. service to the Pacific Coast for some time The trip over that hook-up is by train to El Paso and by plane to Los Angeles

Canadian Air Mail Grows

OTTAWA (CANADA)—Based on the air mail poundage figures for the first six months of this year, it is expected that the total for the year will double and possibly triple the record for 1928 During the first six months, 245,750 lb. were carried under contract as compared with 277,184 lb. for the whole of last year It is expected that the poundage will be tremendously increased by the operation of the Montreal-Toronto-Detroit and the Toronto-Buffalo services

New Airways Map Issued

WASHINGTON (D. C.)—A new airway map covering the entire United States system has been issued by the Aeronautics Branch The map shows that airways now penetrate most of the important centers of the country so that regular air service in one form or another is available for the majority of inhabitants. Markings are used to designate airways operating under mail contract, airways under mail contract but not operating, airways on which mail contracts have been advertised or pending, lighted airways, airways devoted to passengers or express or both and airways on which passengers or express or both are carried in addition to air mail.

Plan $2,000,000 Airport for Cleveland

CLEVELAND (OHIO)—A $2,000,000 semi-public airport of 250 acres is to be built on the east side of Cleveland, giving this city its fourth flying field The airport is to be built by the Cleveland Heights Air Terminals, Inc. R P. Cunningham, vice-president, announced that work on the new airport will start within 15 days and temporary operations in and out of the field may be under way by October 1. The new airport is to be located on Ridgbury road between Ford and Lander roads in Highland Heights Village 12 mi. from the center of Cleveland

It is proposed to operate air passenger lines to Canada and Charleston, W. Va. Other West Virginia towns will be serviced by the lines next year, according to present plans A flying school will be developed and courses covering a period of two years will be offered A hotel will be built to provide meals and accommodations for passengers and flyers Thirty minute bus service from the airport to the heart of the city will be maintained by the airport operators The Airport Development Company has been retained as airport engineers for the construction work

S.A.T. Fitting Radio Stations

FORT WORTH (TEX.)—Installation of both ground and plane radio sets is progressing rapidly as the Southern Air Transport, Inc., perfects the hook-up that is to link every station and passenger plane in the S.A.T. system San Antonio will be the next station to be equipped, and it is expected that the set there will be completed this week. Other stations to be installed soon are Houston, Shreveport, and Atlanta Two ground stations are now in operation, Fort Worth and El Paso

Finish Omaha-Lexington Airway

OMAHA (NEB.)—The work of placing towers beacons and intermediate landing fields between Omaha and Lexington Neb., on the route used by the Boeing lines, has been completed

Would Educate Pilots in Meteorology

WASHINGTON (D. C.) — To obtain the maximum benefit of the improved weather reports that are being sent out at hourly intervals along the major airways Government meteorologists believe that air transport companies should begin to instruct their pilots in some of the fundamental principles of forecasting While it is not thought that it would be either necessary or desirable to fashion pilots into finished meteorologists, it is felt that they will be able to make better use of the weather reports if they have a general understanding about the various cloud formations

The weather service along the New York-Chicago-Los Angeles-San Francisco airway now includes hourly reports from numerous points averaging 60 mi. apart These reports enable the pilots to fly closer to bad weather and it is believed important that they should have their weather-wise sense reinforced with meteorological training to help them to operate on this smaller margin It is also believed that the weather service eventually will bring about a Federal regulation requiring all interstate commercial aircraft to be equipped with radio receiving sets

Until comparatively recently, weather was generally thought to be responsible for quite a large percentage of aircraft accidents Weather bureau officials state, however, that the forecasting service already has been developed to the point where accidents from weather rarely occur, if the warnings are heeded. It is significant, they point out that in the report of the Aeronautics Branch for 1928 only twelve of the 200 accidents recorded were attributed to the weather

Halliburton Plans Bus-Air Service

FORT WORTH (TEX.)—Plans for a combined motor bus and airline service connecting St. Louis and Los Angeles to be opened within three or four months, were outlined here by Erle P. Halliburton of Duncan, Okla., president of Southwest Air Fast Express who with Bob Cantwell, chief pilot for S.A.F.E., passed through here on an inspection of the proposed route

The buses to be put into use on the line will cost approximately $40,000 each and will have every accommodation found on Pullmans, according to Halliburton The buses will carry 14 passengers matching the 14-place tri-engined planes used on the S.A.F.E. lines

Alaska Line Adds Equipment

SEATTLE (WASH.) — Alaska-Washington Airways operating a service from Seattle up the coast to Alaska will place a new Lockheed "Air Express" monoplane in service on this route The plane will be powered with a Pratt & Whitney "Wasp" engine and will be equipped with seaplane floats

FOREIGN ACTIVITIES

Two New Flying Boats in England

LONDON (ENGLAND)—Two new flying boats, both products of firms having long experience in marine aviation types have been introduced in this country recently. One is of the large passenger transport type and is known as the Blackburn Nile, built by the famous Blackburn Aeroplane and Motor Company, Ltd., of Yorkshire producer of the Blackburn Iris flying boat the Blue bird light plane and military types. The other is the Cutty Sark, light cabin flying boat, built by S. E. Saunders, Ltd., which also produced the Valkyrie type flying boat.

The Nile is of all-metal construction except for the fabric wing covering and has a high single wing. The three Bristol Jupiter IX radial air-cooled geared engines are mounted on top of the center section of the wing. Fuel is carried in a streamlined tank between the hull and the wing directly beneath the center engine.

Accommodations are provided for two pilots in a cockpit in the nose and for between fourteen and twenty-one passengers in the hull. The number carried varies with the proportions of mail and freight. Rods and bell-cranks have been substituted as far as possible for wires and pulleys in the controls. Two emergency exits have been provided in the roof of the cabin. Behind the cabin are a steward's pantry, lavatory and baggage compartment. Some of the specifications are:

Span 100 ft., height 19 ft. 2½ in., length 65 ft. 7 in., wing area 1,060 sq. ft., weight empty 11,785 lb., weight loaded 20,000 lb., disposable load 8,215 lb., maximum speed 105 knots, cruising speed 87 knots, landing speed 55 knots, ceiling 14,000 ft., range 450-800 mi.

The Cutty Sark has a single cantilever wing and is powered with two Cirrus Hermes engines 105-115 hp. air-cooled four cylinder in-line engines. It is said to be able to fly on one engine. It is designed so that one engine of 200 hp. or three engines of 80 hp. each may be substituted. It will carry a pilot and four passengers. The wing is of wood construction covered with plywood while the hull is of metal frames covered with Alclad. The specifications are:

Span 45 ft., height 11 ft. 2 in., length 34 ft. 4 in., wing area 429 sq. ft., weight empty 2,246 lb., weight loaded 3,400 lb., maximum speed 105 m.p.h., cruising speed 85 m.p.h., range 340 mi.

Bleriot Feted on Anniversary

PARIS (FRANCE)—Louis Bleriot has been the center of a number of celebrations in this country and in England in memory of his cross Channel flight July 25, 1929.

Italian Air Budget Announced

ROME (ITALY)—The Italian air estimates for the next year have been set at $37,750,000, maintaining the same volume in effect since 1926. The Italian air force at present includes 97 squadrons organized in thirty-one groups. There is one air-ship division for each three groups.

Try Contact Device For Planes and Ships

BERLIN (GERMANY)—There has been developed here a device to facilitate contact between seaplanes and steamships at sea. It consists of a long inclined platform made of canvas and braces extending from the stern of the ship down to the water at a general grade. The lower end of the platform is submerged sufficiently to permit the floats on the plane to "ground" on the platform within reach of the steamship's crew.

Cross braces down the center of the platform provide steps for the handlers. Ropes and mooring fixtures also are provided. By this method catapults are eliminated and the contact may be made between plane and ship while the steamship is proceeding at little, if any, retarded speed. Tests of the device have been carried out by North German Lloyd line officials with a Heinkel on the steamship Lutzow. It is the invention of Herr Riwull.

Make Glider Distance Record

BERLIN (GERMAY)—The outstanding event of the tenth gliders' contest in the Rhön Mountains so far reported has been the distance record flight by Robert Kornfeld, noted glider pilot, of about 93 mi. He took off from Wasserkuppe, the summit of the mountain range, and landed about 13 mi. from Gera after crossing the Thuringian Mountains at an altitude of about 9,842 ft.

Robur Parachute Makes Appearance

STOCKHOLM (SWEDEN)—The Robur parachute, a product of the makers of the Thornblad parachute, has been announced here by Carl H. Lundholm, general representative. Extensive tests of this parachute have been made in Germany using planes at high speed and in spins, the chute appearing to work satisfactorily. Both automatic and manual releases have been installed in this type.

The advantage of the automatic feature is that a pilot can jump from the machine without any further action on his part, the weight of the jumper on the rip cord attached to the plane operating the chute. The action is something like this:

As the rib cord is pulled out of its pocket it in turn pulls out an insulated steel wire running along one side of the container. Removal of this wire frees the elastic cover and this in turn releases a pilot chute packed in a separate division from the main parachute. This pilot chute as it fills with air pulls out a couple of pins which allow the main parachute to catch the air and open in usual fashion. The automatic and manual releases operate on opposite sides of the container to prevent interference. The same action, however, is employed in each method.

The pilot chute is packed separately from the main chute because of the designer's belief that there is less chance of interference between them or possible capsizing of the main chute. A number of rubber edged apertures have been built in the main chute. These assist in the opening and also reduce the rate of descent. The chute is of the back pack type.

The designer is particularly anxious to demonstrate his faith in the automatic type of parachute. This style is not popular in the United States the manual type being used almost exclusively.

The Heinkel being "grounded" on the contact device with which the North German Lloyd line is experimenting.

Foreign News Briefs

On July 6 a record volume of 25,000 pieces of mail left Croydon, England for India on the Imperial Airways service. Fourteen passengers were on the plane.

The Wilson Airways has been organized to offer flying services in East Africa. A Gipsy Moth is being used and an Avro and a Westland tri-engine cabin monoplane have been ordered.

A civil aviation section has been formed by the London (England) Chamber of Commerce.

A special freight carrier has been developed by the Fokker Works in Holland for the K.L.M. It is powered with a single Jupiter engine, cruises at 106 m.p.h. and carries a pay load 2,733 lb.

During June trial night flights were conducted on the Stockholm-Malmo-Copenhagen-Hamburg-Amsterdam line and the Oslo-Gottenborg-Malmo-Copenhagen-Berlin line.

Colonel the Master of Sempill has been selected president of the Royal Aeronautical Society. Vice-presidents will be Sir Vyell Vyvyan, who has been air vice-marshall; Lt. Col. J. T. C. Moore-Brabazon and Mr. H. E. Wimperis.

Progress is reported on the construction of the huge Caproni six-engined all-metal passenger transport. Each engine is to have 1,000 hp. and the plane will have a wing-spread in about 130 ft. According to present plans it will be flown to South America.

Capt. Hermann Kuehl is said to have agreed to go to Africa in February to engage in piloting planes of a German missionary society.

Air mail in Italy requires now a postage of $0.05 for each gram (.70 oz.) or fraction thereof, for each 1,000 km. (621 mi.) in addition to regular postage.

The pilot of the City of Ottawa Imperial Airways transport which crashed in the English Channel June 17 has been cleared of blame by the court of inquiry.

Captain Herschend starts this month for Greenland to conduct for the Danish Government a thorough survey of sites available for landing aircraft which might be used in an air service between Europe and North America.

The Paris *Herald*, European edition of the New York *Herald-Tribune*, is shipping copies of the morning paper to London by a special dawn plane service. The service will be continued through the summer.

Iceland's only plane is being used to spot herring schools on the northern coast. So successful has this been that two more planes are to be made available for the service.

It is reported that one-fifth of the passengers using Austrian air lines in 1928 were Americans. There were 1,374 Hungarians, 875 Americans and 560 Germans.

Luft Hansa Tests Romars

BERLIN (GERMANY)—The three Rohrbach Romar flying boats which have been bought by Luft Hansa for its proposed experimental trans-Atlantic service to South America, have been delivered and are undergoing a series of tests in the Baltic sea. Several cruises, one to Iceland, are to be carried out in the near future. The Romar is a twelve passenger monoplane powered with three 500-720 hp. B.M.W. water cooled engines. They have a cruising speed of about 100 m.p.h.

Russia to Extend Its System of Airways

MOSCOW (RUSSIA)—This country hopes to extend its present 11,800 mi. of airways to about 31,000 before 1934 according to a recent exposition of plans included in a five-year development program. The services projected would include passenger as well as mail facilities. Russia expects to link up distant cities within its borders and also make connections with large centers in other countries. Consideration is being given to the proposal for a line to the North American continent.

There are three air transport companies in operation now. Ukrmsilukput operates a passenger service across the Ukraine and the Caucasus territory to Teheran in Persia. Dobrolet operates between Moscow and Siberia and Central Asia. Its Moscow-Irkutsk route is 3,125 mi. long. From Irkutsk there is a line 1,200 mi. long into the Siberian gold district with Bulakh as the terminal. Still another line 1,600 mi. long extends from Irkutsk north to the heart of Siberia. It is planned to link this city with points in China and Japan in the future. The third company, Dobrolet operates the Leningrad-Moscow-Berlin line and until interrupted by the Afghan civil war ran a four times weekly service between Tashkent and Dushambey on the Afghan frontier.

[As we go to press a Russian plane is ready for a Moscow-New York good will flight—Editor.]

Handley Page Tests Guggenheim Entry

LONDON (ENGLAND)—The Handley Page entry in the Guggenheim Safe Aircraft competition has been completed. The machine, designated by the company as the Guggenheim, is said to represent an effort to carry the use of slots and flaps to a its logical conclusion. The company's brief report on the plane says:

"The machine has automatic slots interconnected with wing flaps running all the available length of both top and bottom planes. A wide, long travel undercarriage is fitted as well as wheel brakes.

"Tests which have been carried out on the Guggenheim have revealed remarkable safety qualities combined with a good all-round performance and a high top speed. The machine has been frequently taken off with the stick held hard back by the pilot.

"The Guggenheim will probably open the way to a more extended use of automatic wing slots on all civil aircraft and to the employment of the interconnected automatic wing slot and wing-flap for those machines which require an extremely wide speed range."

The lines of the plane bear the stamp of the Handley Page design. It is a two-place biplane powered with what appears to be an Armstrong Siddeley Genet of 80-88 hp. The front seat is between the wings. There is considerable stagger and the lower wing is much smaller in area than the upper.

Zeppelin Engines Approved

FRIEDRICHSHAFEN (GERMANY)—The Graf Zeppelin has been declared ready for a trans-Atlantic flight. This announcement followed a series of test flights in which the performance of the new Maybach engines were given close scrutiny. They were said to have functioned satisfactorily. The airship is now ready to resume its series of long distance flights, including one around the world, which was interrupted in May when the engines faltered west of Spain.

The Handley Page bid in the Guggenheim safe plane contest. This machine is said to include several of the latest devices for safety in aircraft operation, such as slots, flaps, etc.

WHAT OUR *Readers* SAY

Big Flying Boats

July 20, 1929

TO THE EDITOR

We now have in existence seagoing airplanes ranging up to 160 ft span and larger craft in prospect. Landplanes over 100 ft in span have been flown but as yet no pronounced commercial need of a large landplane has been made evident.

The flying boat, however, showed a tendency toward increase in size in its very earliest stages. Large size and corresponding weight do not exert the limiting influence on flying boats that they do upon landplanes. In fact the designer who is possessed of a reasonable amount of prophetic faith in his guild would hesitate to place any top limit on the size of future flying boats.

We are becoming familiar with the fact that economic suitability (sometimes disguised as public fancy) is dictating the development of commercial productions. I think we can be fairly certain that the size of flying boats will be governed by the findings of flying boat operators just as the dimensions and characteristics of mail planes have been governed by the mail plane users.

A great many valuable lessons were learned in the construction and attempted operation of the S. S. "Great Eastern." Valuable lessons were learned in the construction and operation of the Barling Bomber, the "Lexington" and "Saratoga" and the "Richard Penhoet." These giants are concrete evidence of man's courage and ingenuity in construction and prove that large size is not an obstacle in construction.

It is true, however, that most giant constructions have proved to be uneconomical. It is true that some giant ventures have proven to be correct indications of the economic trend. This appears to be the case with giant skyscrapers.

My point is this: that the only giant constructions which have proven to be economically sound are those which were arrived at by progressive development and which were projected only after the economic trend had been quite clearly defined. There is some tendency that the progress of flying boat development may be handicapped by vaulting ambition which may o'erleap itself and be forced later on to abandon one line of development and make up for lost time along another line of thought. It seems wise therefore that we should investigate thoroughly to find the correct economical size of flying boats rather than to satisfy our academic curiosity as to how large a flying boat can be made. It appears that it is quite easily possible to do a grave injustice to those who are earnestly endeavoring to make a success of flying boat operation. For while it is true that the design of operating equipment will eventually be governed by operating requirements, it is also true that in the formative stages operators will endeavor to use such equipment as is available and therefore I firmly believe that the designer should earnestly endeavor to anticipate the trials and tribulations of the operator and should provide for his use equipment whose economic advantages have been rather clearly indicated by progressive development.

LESSITER C. MILBURN
2nd Vice-President-Chief Engineer
The Glenn L. Martin Company
Baltimore, Md.

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Cruising Speeds

July 21, 1929

TO THE EDITOR

Does the term "cruising speed" really mean anything definite? When used without qualification, as it often is in reports of airplane performance in AVIATION and elsewhere, it would seem to apply to any speed whatever between maximum and minimum, and so is valueless as a basis of comparison of the merits of different machines. Until authority or usage has endowed the term with more meaning than it now has, would it not be good practice to give the cruising speed of an airplane only when the corresponding engine speed or power is likewise given?

CHARLES H. CHATFIELD
West Hartford, Conn.
(Pratt & Whitney Aircraft Corp., formerly Associate Professor of Aeronautical Engineering, M.I.T.)

[Mr. Chatfield raises an interesting point. His perplexity is one which we have often shared. Cruising speed is determined largely by the throttle setting which pleases the pilot's fancy. We do not, however, despair of securing a definition, and we suggest it as a suitable field for the interest of the Department of Commerce, the National Advisory Committee for Aeronautics or the Society of Automotive Engineers. As a starting point, we propose that cruising speed be taken at 85 per cent of the maximum rated r.p.m. of the engine.—ED.]

Editorial Comment
FROM THE DAILY PRESS

[This heading will be used frequently in the future. Editorials will be chosen for reproduction without reference to whether or not they agree with the views of this magazine. We want to present to our readers representative samples of what intelligent non-aeronautical people are thinking about happenings and trends in the world of aviation, whether their views be flattering or critical. We shall be very grateful to any readers of this page who will forward to us editorials which they may consider worthy of reproduction.—ED.]

The Courage to Turn Back

"PERHAPS it took more courage to make this decision than a foolhardy one to go ahead and meet almost certain death," said the Paris *Matin*, commenting on the action of Dieudonne Costes in turning back after he had flown almost half the distance across the Atlantic Ocean. And most reflective persons will agree. To give up on a venture where courage is involved must be distasteful to anybody; to a Frenchman it must be especially distasteful, for there are few nations which esteem courage so highly as the French. Yet Costes did give up, and a French newspaper applauds him for it. Aviation, in the year 1929, seems to be growing up.

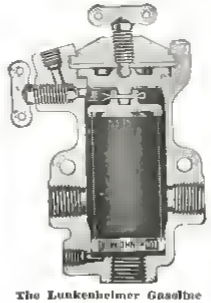
It flies to Paris, to Rome, in two hops instead of one, it learns to reinel in flight, to avoid the danger of a take-off with heavy fuel load, it turns back when the weather is bad and waits for a better day. It loses its youthful daredevilishness but gains a mature sobriety. And it makes a great gain in public confidence; for the average man, no matter how much he may applaud the flyer who is going to get there or die, is going to ride with the flyer who is not afraid to turn back when the head wind begins to blow. Costes has set a precedent which may save many lives in the future.

—*N. Y. World*

THE BUYER'S LOG BOOK

Lunkenheimer Gasoline Strainer

AN ALUMINUM gasoline strainer for aircraft installation and incorporating a number of original features has been developed by the Lunkenheimer Company of Cincinnati, O. This strainer has been designed exclusively for aircraft use, and is interchangeable with the Air Corps C-1 strainer in mounting. The distance from center to center of supporting lugs and diameter of both holes are the same. The supporting lugs on the Lunkenheimer strainer project behind the back of the body sufficiently to bear against the fire wall or other metal plates to which the strainer may be attached. Therefore when tightening the supporting bolts, the contact is directly between the plate and lugs and not between the body and plate, which would have a tendency to bulge the plate. These strainers are available with ¼ and ⅜ in. pipe connections. "Inlet" and "outlet" are cast on these respective connections.



The Lunkenheimer Gasoline Strainer

One of the features of this new strainer is the ease with which it is cleaned. The gauze holder assembly, being a unit, can be easily removed and inserted with one hand. There are no loose parts to become lost. Two gasoline inlet connections are provided especially for planes having two wing tanks. These separate connections of the strainer eliminate a number of fittings in the fuel system.

A ⅛ in. pipe connection at the top of the strainer is provided to furnish a supply of gasoline to the primer on the engine.

Another important feature is the drain valve, which has been made part of the body and not part of the cap. In this strainer the drain may be piped off to the outside of the fuselage and does not interfere with the removal of the strainer assembly. The drain connection is threaded for ⅛ in. pipe.

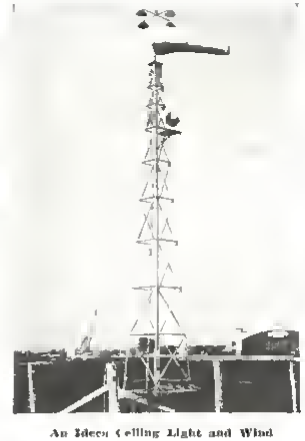
"Aeroflex" Metal Hose

INCLUDED in the aviation products of the Breeze Corporations, 24-46 S. 6th St., Newark, N. J., is a specially designed and constructed flexible metal tubing, known as "Aeroflex." This tubing is intended for use on engines, planes, test stands, as exhaust tubing, cabin heater tubing, wire covering, heaters for carburetors and for a number of other purposes.

"Aeroflex" is made in a number of sizes and of various metals, including aluminum, brass, copper, duralumin, galvanized steel, monel metal, plain steel, stainless steel, zinc alloy, and a number of others.

Ideco Ceiling Light Tower

A COMBINATION ceiling light tower and illuminated wind cone has been recently placed on the market by the International Derrick & Equipment Company, Columbus, O. One of these is installed at the Port Columbus Terminal of the Transcontinental Air Transport, near Columbus. These towers resemble somewhat the standard Ideco Airway Beacon Towers. They are 35 ft. high and have a bracket for the ceiling light, placed 7 ft. below the top. A 6 ft. pipe extension carries the wind cone, four lights with reflectors for illuminating the cone and an obstruction light. Provision is made for the wind cone to rotate freely without danger of fouling. These towers are built of structural steel, hot dip galvanized after fabrication, providing complete protection against rust and corrosion. They are built over jigs and dies, insuring a perfect fit of every member and avoiding the possibility of field fabrication. While the 35 ft. tower is standard, additional height may be had if desired.

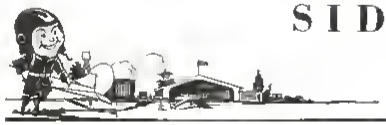


An Ideco Ceiling Light and Wind Cone Tower

Simplex Slap-Chek Expander

THE Simplex Piston Ring Company of America, 1966 E. 66th St., Cleveland, O., has announced the development of the "Slap-Chek" expander for engines having excessive piston clearances. This device provides a differential pressure by variation of the thickness of the special alloy steel from which it is made. Dowel pins are provided to hold the expander in place after installation. These pins are located in shallow holes drilled in the bottom of the piston ring grooves, with the Simplex drill jig.

These expanders hold the pistons firmly against the front cylinder wall in such a way that both the head and skirt of the piston can be considered as being held in a trough formed by the front half of the cylinder bore. This eliminates the possibility of the piston being slapped against the cylinder wall.



SIDE SLIPS

By
Robert R. Osborn

MR. R.A.S. of New York points out with tears in his eyes that sordid commercialism seems to be gaining a stronger and stronger foothold in aviation, and nowadays only a few of the old timers are flying for the love of the game. The following item from the New York *Times* seems to be the cause of his discouragement:

"RED BANK, N. J., July 4th.—A crowd estimated at between 15,000 and $20,000 attended the second day of the air races at the Red Bank Airport today."

• • •

The news comes from K.E.C. of Hayward, Calif., that a man in Oakland recently won an airplane in a nation-wide contest by driving a golf ball a total of 1,287 yards and 6 inches in three drives. "The Intrepid Aviator was very much interested in this when we called it to his attention and thought that he would hold a similar contest when he finally had to part with his Jenny. However considering the skill required to successfully pilot a Jenny he would award it to the man who could make the best approach to a green out of a sand trap, over some trees and under some high tension wires."

• • •

S.J.B. just dropped the comment over our shoulder that with present endurance flights one may go up as a private licensed pilot and come down as a transport pilot which considering the great number of such flights in progress should relieve the present shortage of transport licenses.

Possibly we should get more excited and het up over these refueling endurance flights than we do but we

agree somewhat with the opinion of such flights expressed by the esteemed Jay E. House of the New York *Evening Post*. He pointed out that when he was a boy the farmers in his county had a contest each year to see who could stuff the longest sausage. Finally one year a neighbor stuffed one fourteen feet long and after that no one even bothered trying.

• • •

MR. R.A.V. of Tampa, Fla., turns in some material for the Prevention of Cruelty to Motors section of our Society for the Aeronautical Education of Artists and Newspaper Reporters from the Tampa *Tribune*. "Three struts holding what is known as the exact valve motion were sheared off in some unexplained manner, the chamber explained after they had inspected the ship. This they said allowed compression to accumulate in the cylinders forcing gasoline back into the carburetor and gradually smothering the motor."

We hope no one will be fooled by any such story as this even if they do stick to it. From the evidence we find it a clear case of putting too many gas savers on the motor, with no provision for siphoning the excess gas overboard.

• • •

The Intrepid Aviator smoked a couple of our cigars the other day while he was commenting on the news that the golf course alongside of

Roosevelt Field on Long Island is going to erect a one hundred and twenty foot fence to keep airplanes from crashing in its links. He says he gets into that field with his Jenny once in a while and as he wouldn't like to have to take his ship apart each time he landed there he had written to the golf club officials to ask for a hole in the fence about the size and shape of a Jenny and about ten feet off the ground.

• • •

MR. R.F. of Newton Centre, Mass., sends in the following clipping with the note that the poor old OX-5 isn't held in the respect that it used to be.

"The race of OX-5 motored ships for those of ninety horsepower was won by Ed Winkle in his Brunner-Winkle biplane which flew the twenty five mile course in 17 minutes and 22 seconds. Felix Hornke in a Curtiss Robin was second, closely followed by A. S. Prolunst in a Wicu. Buland's model was powered with rubber bands."

• • •

MR. A.M. of San Angelo, Texas, sends in a clipping from his local paper concerning the Swedish fliers—"The aviators had been here four weeks trying to get their flying boat, 'Sverige,' into condition for the next lap of their trip."

Possibly the aviators have come to regard their ship in the same light as have some of our friends who are private owners—frequent comments be-

ing heard from them concerning ships which are eating their heads off—most of them seeming to consider their ships more as flying white elephants.

• • •

From J.B.D. of Detroit comes the news. Four homing pigeons and a trimotored Ford plane left Chicago for Detroit at 4 p.m. The plane arrived at 6.28, two of the pigeons at 7.47 and the others at 7.55.

We understand that when interviewed the pigeons complained of head winds, airway maps which didn't agree with the latest changes in railroads and rivers, and ordered that their compasses be calibrated.

• • •

While we are on the subject of flying schools, E.O. of Santa Barbara, California, seems to be all het up about a clipping which he sends in. (Incidentally, anyone who doesn't recognize those initials hasn't been reading about flying from 1910 on.) The clipping tells about an attempt to teach a woman to fly in one day at a Portland, Ore. school. Instruction will begin at 4 a.m., and it is hoped that by 7 p.m. she will have become sufficiently familiar with the action of the controls to attempt a solo flight."

If this woman student is at all like the one we saw turn up at one of the eastern fields recently by 7 p.m. she would be familiar enough with everything and everybody in aviation to offer Lindbergh some pointers on landing with a wheel missing.

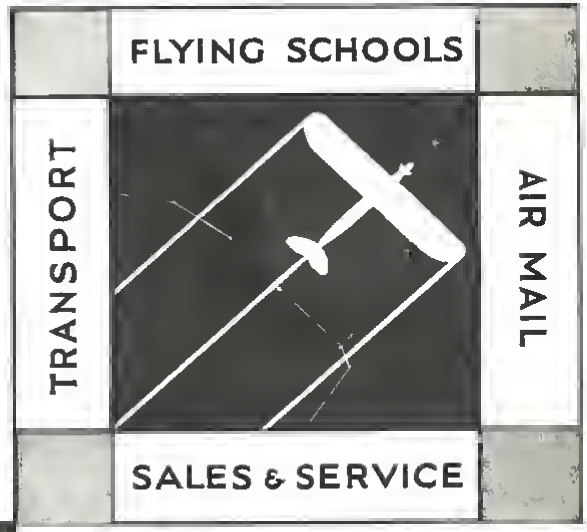
AVIATION August 3, 1929

A FEW MEN WITH FORESIGHT

Will See the Future of Aviation and Take Advantage of a Present Opportunity

Well located automobile agencies are bought and sold today for many thousands of dollars. When the automobile industry was in the same stage of development as aviation today, it was difficult to convince business men that money could be made in the sale of automobiles. The same situation has been true with the motion picture, radio and other industries which have enjoyed a rapid popular growth • The men with foresight to acquire automobile, radio and motion picture franchises when these industries were in their infancy have developed increasingly profitable businesses • This opportunity exists today in aviation for those men who can see the time when planes will be in general demand for business, for personal transportation, and for sport • To a limited number of men of standing, Colonial Flying Service offers agencies in New York State and New England for the following planes: Fleet—Fairchild—Challenger—Pitcairn—Bird—and Standard • Based on its background of operating experience in air mail—passenger transport—and the maintenance of flying schools, Colonial is able to advise dealers on all subjects connected with the operation of a profitable sales agency • A Colonial franchise covers not only the ships themselves, but everything pertaining to their operation and maintenance • Colonial agencies for the sale of planes are exclusive. A reasonable amount of capital is required. Affiliation with an established flying field can be arranged • If you are interested in obtaining a Colonial franchise, write us for territories available and conditions for securing an agency.

A small part of the Colonial Fleet at the Buffalo Airport, Buffalo, New York



The Colonial System includes transport routes: New York to Boston—New York to Montreal—Albany to Cleveland—and Buffalo to Toronto • In addition to the cities above, Colonial air mail routes reach Hartford—Schenectady—Utica—Syracuse—Rochester—and Erie • Colonial Flying Schools are being established in the principal cities throughout New York State and New England.

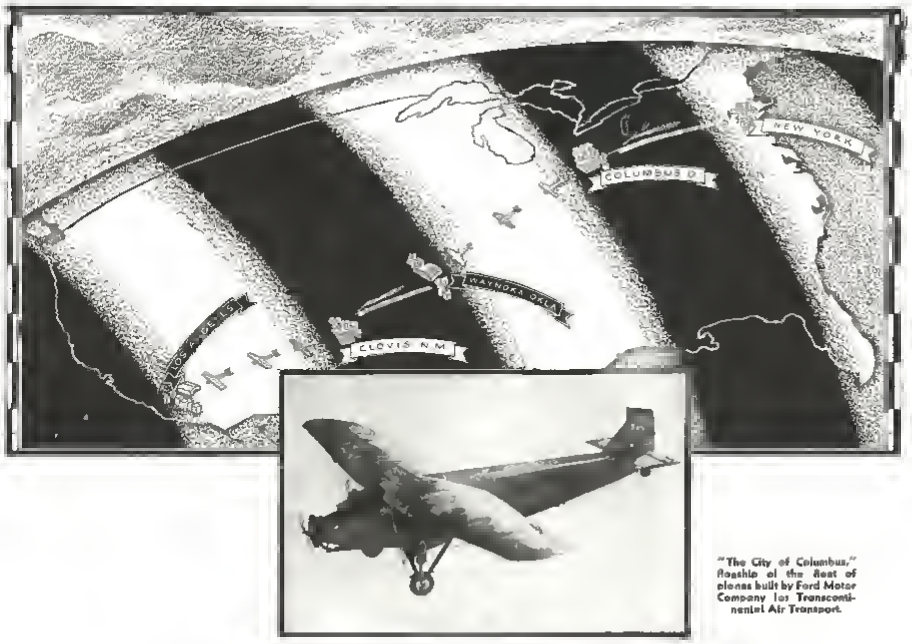
COLONIAL FLYING SERVICE, INC.

270 MADISON AVENUE NEW YORK CITY

District Sales Offices

Boston Buffalo Hartford Schenectady

THANK YOU for mentioning AVIATION



"The City of Columbus," flagship of the fleet of planes built by Ford Motor Company for Transcontinental Air Transport.

THE LANES OF THE SKY
meet the lines of the land

RAIL transportation has acknowledged the airplane as an ally.

Passengers on the T. A. T. leave New York with the twilight, roll through the night in a Pullman bed, fly above earth in luxurious surroundings during the hours of daylight, and land, at the end of the second day, in Los Angeles. Two wonderful panoramic days and two comfortable nights to span the continent! Incredible time, surrounded by every element of safety that the science of rapid travel can bring to bear.

* * *

It is entirely in order that the Ford Motor Company should share in this great co-ordination of air and rail transport. That company has pioneered the principle of a power vehicle that "takes you there and brings you back," reliably . . . safely. It gave to the automobile its first real commercial meaning. And with the same ideals—with a perfected organization and perfected tools, it is establishing the Ford plane as a definite factor in both commercial and travel life.

Nothing could be more indicative of the trend in aircraft design than that the Ford engineers, always alive to factors of strength, durability and safety, have adopted strong Aluminum alloy and Alclad Aluminum alloy sheet for a vast majority of their fabricated aircraft parts.

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More than half of the material in even the engine consists of strong Aluminum alloy—and the balance of the entire ship—with the exception of a very few steel and rubber parts—is fabricated from Aluminum and its alloys.

Aluminum Company of America, creator of these alloys and foremost authority in their use for aircraft purposes, solicits inquiries for sheet, tubing, castings, forgings and screw machine parts. Personal contact with the technical staff is invited.

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Only licensed pilots, licensed mechanics and students are eligible.

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Full particulars and entry blanks will be mailed upon request—address: **Contest Committee,**

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break more trans-continental records

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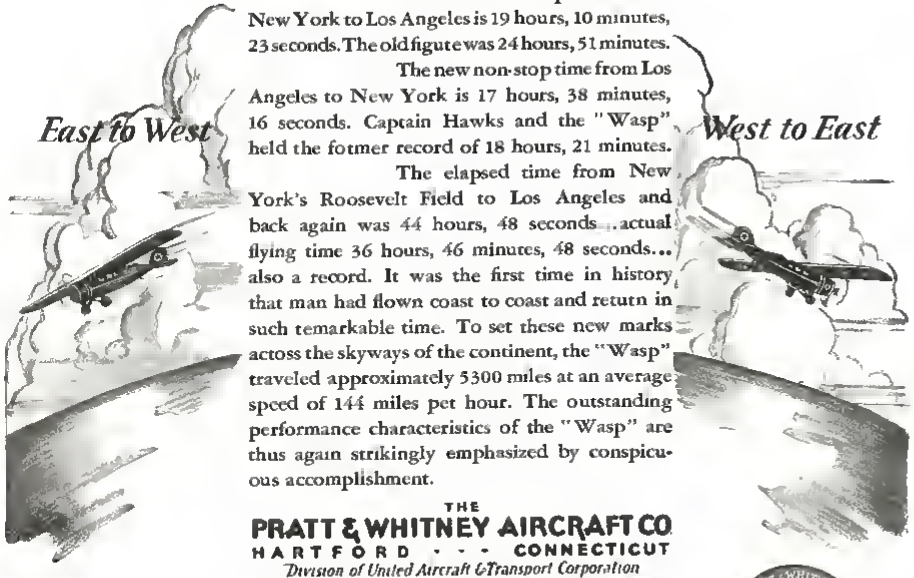

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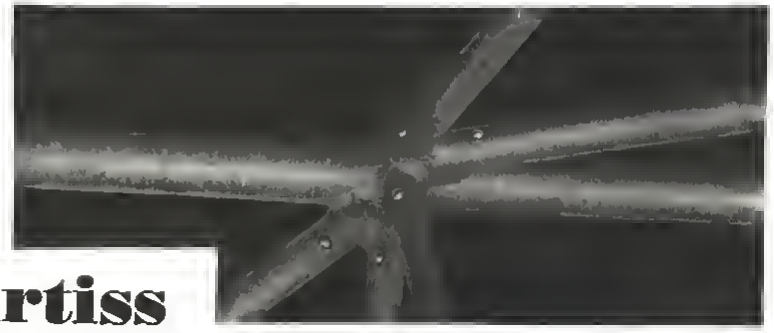

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To make permanent fastenings to iron, brass and aluminum castings, steel, Bakelite etc. Hammer the Hardened Metallic Drive Screw into a drilled or formed hole. The Screw taps a thread in the material, and makes a fastening that stays secure even under constant vibration and severe service.

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HARDENED
Self-tapping Screws

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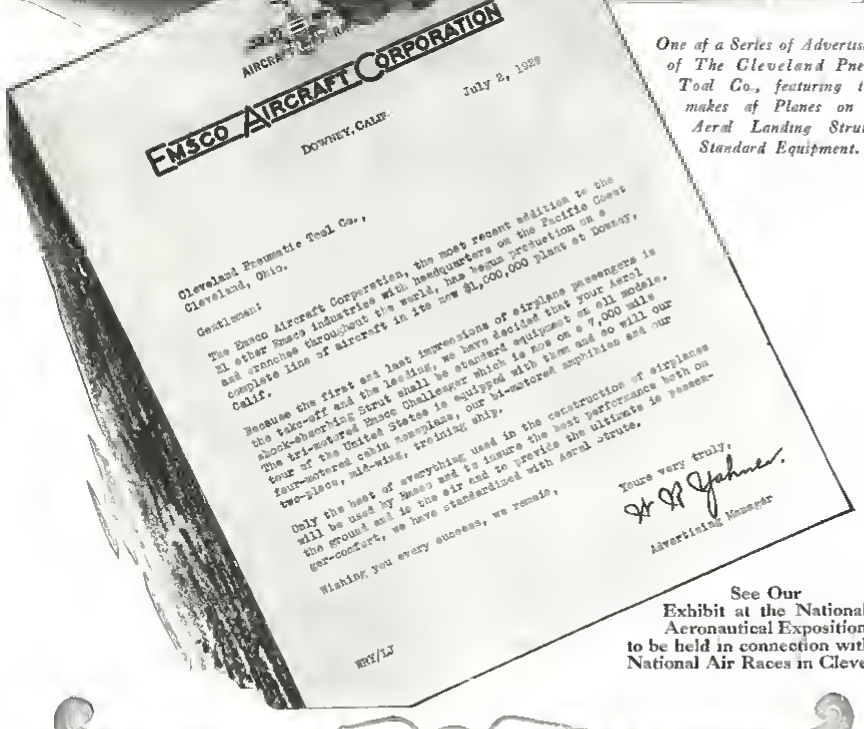

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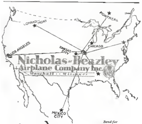

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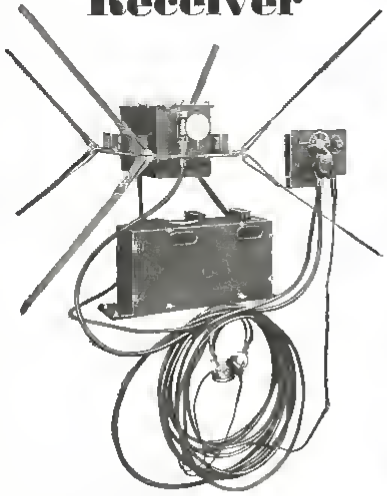

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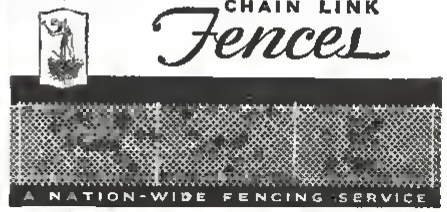

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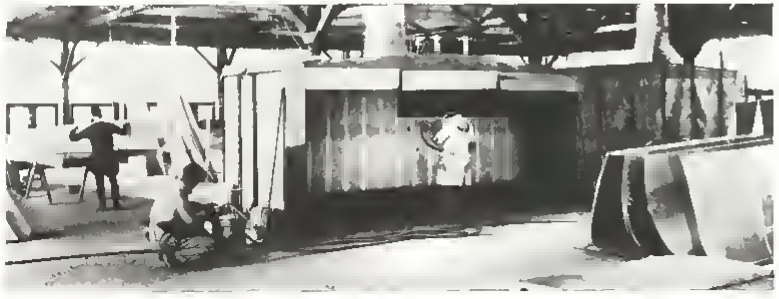

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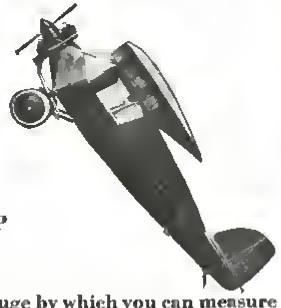

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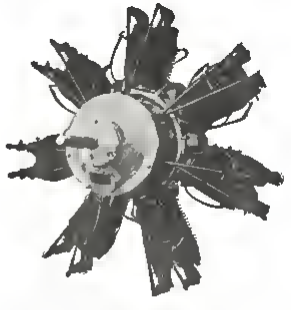

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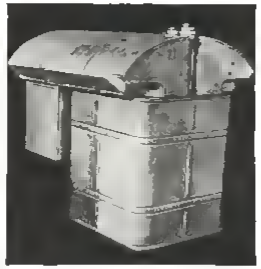

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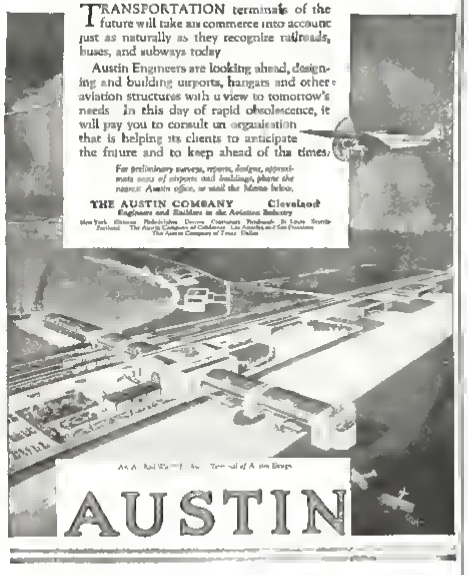

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FOR SALE

ABSOLUTELY sound licensed Challenger 11 months 150 hours new Berryloid newly rebuilt motor Thompson valves Miller rockers Monoid propeller parachute seat $2,300. G M Greer 184 Ward St., Newton Center Mass.

AIR KING OX-5 bargain. New last August. Completely reconditioned. All new landing gear. Eligible for license. Never cracked. Fly away $1,600. Monarch Aircraft Industries, Rockford Illinois.

AMERICAN Eagle OXX-6 1928 model dual controls compass never cracked for sale. Ignace Dolata 331 19th Ave., Milwaukee Wis.

AMERICAN Eagle 1928. Motor just overhauled. Ship in first-class shape. Priced for quick sale $1,500. Inquire Teterboro Airport Hasbrouck Heights N. J.

ARROW 5 new complete re-cover and overhaul powered with new Hisso E 180 carrying 100 hour guarantee $2,300. 1928 American Eagle complete overhauled motor $1,800 less motor $1,100. Southern Iowa Airways Inc. Bedford Iowa.

AVRON Avian with less than 90 hours. Motor and ship have just been completely overhauled. Special equipment including a pair of Edo pontoons which have never been used. Sacrifice for an immediate sale. FS 175 Aviation Tenth Ave at 36th St New York.

BARGAIN OX-5 Waco 10 turns up 1,400 on ground. Hartzell propeller, dual, all extras $1,100. Address Tom Smith 33 Nassau Ave Freeport N Y.

CHERUB Lenape 32 hp. only run ten hours total run since it won 1928 Light Plane Races. Lamination propeller for above, two 18-inch Palmer wheels with axles. The lot $500. Powell 158 Alcombie Detroit Mich.

CLOSING out business. large amount engines, new and used equipment parts planes, different makes will be sold one-half their value. Now is your chance to get bargains. Write or wire your needs. York Airways, York Pa.

COMMANDAIRE OX-5 new Sept 1928. Has 100 hours. Never cracked up. Perfect condition. Also two Russell Lobe chutes and one Hisso 180 motor. Just rebuilt. Ralph Wilson Jr c/o Whitlaker Mfg Co Howard Ave Bridgeport Conn.

CURTISS Seagull C 6 A motor. Reed props, ship completely overhauled and in finest condition new tail all wires and fittings renewed covers and a bargain for quick sale. Waco 10 with E-4 Hisso special paint job wheel brakes complete set of latest navigation instruments used privately two months. Owner buying cabin ship. New Dixie 800 mags fit OXX or Hisso new Jenny landing gears pusher and tractor OXX props wide blade tipped OXX cylinders $18 used but in good shape new gas tanks of all shapes gun plan and aluminum at low. lots of used OX and OXX motors $300 up overhauled Hisso A $500. Liberty six $350 all radiators for Hisso $5 gravity wing tanks $5 AC plugs new 35c each in lots. P Mills Easington Pa.

FOR SALE 1928 Waco 10 like new equipped with new J-5 Wright Whirlwind motor. Instruments front and rear cockpits. Price $5,200. Flyaway. Ronald McCuaig 109 South La Jolla St., Los Angeles Calif.

FOR SALE, sport light plane complete, flyaway. Also fuselage rudder propellers light plane parts. Can be seen anytime. FS 157 Aviation, Tenth Ave at 36th Street New York.

FOR SALE One 60 hp. LeBlond and one 35 hp Anzani engine. Also have number of 60 hp Velie M-5 engines purchased on large contract. Having now adopted 95 hp engines as standard on our Golden Eagle airplanes we are willing to sell these smaller engines which are all new at reduced prices. Golden Eagle Aircraft Corporation 415 East Industrial Avenue Inglewood Calif.

FOR SALE OX-5 motor never out of original crate best offer over $750.00. 60 hour OX-5 guaranteed good as new $450.00. American Eagle 1928 model, OX-5 with scintilla miller compass air speed etc. One year old licensed kept in hangar never cracked $2,500.00 or will trade on new production motored new ship. Youngstown Flying Service 25 W Hylda St., Youngstown Ohio.

FOR SALE 1928 Waco 10 NC licensed June 1929 entirely redoped motor turns 1,420 on ground. Miller Rock Arms. Perfect condition throughout $1,775. Flyaway. Albany New York. Albany Air Service.

FOR SALE OX-5 complete with new exhaust manifolds hub and propeller. Motor rebuilt. New rings valves guides, springs rock arm assembly light. Magneto and carburetor rebuilt. Motor had 5 hours when wind damaged ship beyond repair. $400.00. Jon L. Comerford 5317 So Sawyer Ave Chicago Ill.

FOR SALE OX-5 American Eagle used 65 hours as demonstrator dual control is $2,500. One OX-5 American Eagle used 200 hours, dual controls, navigation lights booster recover oilers $1,800. Both ships inspected by Dept of Commerce June 1st. Never been damaged, and both in excellent condition. Del-Mar-Va Airport Hebron Md.

FOR SALE 2 C-6 Fairchilds 2 OX-5 Travel Airs 1 OX-5 Eaglerock. Curtiss Flying Service, Inc. Valley Stream Long Island N Y.

FOR SALE One OX-5 motor complete, ready to run $400.00. One OX-5 motor overhauled bronze valve seals, silcrome valves less carburetor and valve action with enough spare parts for complete valve action price $200.00. One Hartzell propeller with spinner $40.00. One tooth pick propeller $10.00. Waco 9 fuselage and tail assembly seats and dual control with cowling. Best offer takes this. FS 189 Aviation 520 No. Michigan Ave Chicago Ill.

FOR SALE Velie Monocoupe like new. Motor just overhauled turns 1,975. Leather upholstering and winter heater. Kept in hangar and flown by private owner, 80 hours. Ship licensed and log certified $1,500. Act quick. L B Thomas Eldorado Apartments Fond du Lac Wisconsin.

FOR SALE Warner powered Travelair new. Ready. Tires and landing gear. Sidereds wheels and brakes spare wheel Heywood starter dual controls navigation lights compass spare propeller cockpits finished in genuine Spanish leather. Must be seen to be appreciated. Priced for quick sales $4,250. Mono Aircraft Corp Moline Ill.

FOR SALE 50 OX-5 motors. Some rebuilt like new, rest as is. Price range $300–$500. FS 164 Aviation Tenth Ave at 36th St. New York.

FOR SALE—Ryan brougham C-4032 flown 182 hours privately used kept in government hangar. Price $8,000. Wire or write C. L. Sessons, 407 Citizens Bldg. Fayette County Uniontown Penna.

FOR SALE by Distributor one Whirlwind Laird nearly new. One Whirlwind Laird factory rebuilt engine and new covering. One Speedwing 300 hp. FS 101 Aviation Tenth Ave at 36th St New York.

2 M F flying boats with model E Hisso for $3,600. One combination Eaglerock with de luxe Edo pontoons and OXX-6 motor for $2,500. 5 Model E Hisso motors overhauled $500. FS 185 Aviation 520 No. Michigan Ave., Chicago Ill.

MONOCOUPE like new always kept in hangar and flown by owner only has had 125 hours and has never been cracked or strained. Price $2,000. Home address 112 E. Lullwood Ave. San Antonio Texas. Or can be seen at Winburn Field. Floyd Pruss.

NEW OXX-6 motors in original boxes, very reasonable price. Will ship with privilege of inspection. Grant Marine Motor Company 2525 St. Clair Ave., Detroit, Mich.

NEW Standard Eaglerock with new OX-5 other motor optional ship still at factory take best cash offer. Sorensen c/o Peabody Houlings 10 S La Salle Chicago Ill.

PARACHUTES new and used rope ladders for stunt men etc. Specify weight. Thompson Bros Balloon and Parachute Co., Aurora, Illinois. Established 1903.

PHEASANT C-3103 A-1 condition. Motor has new rings. Miller valve actions. Bargain at $1,550. FS 194 Aviation 520 No Michigan Ave Chicago Ill.

OX5 STANDARD completely reconditioned. Engine and covering same condition as new. Dual control D H landing gear. Less motor $400. A real buy. C R Muhlberger Hamilton Ohio.

FOR SALE Two Waco 90's like new. Priced for quick sale $2,500.00 and $2,750.00. Complete flying course free with each. Robbins Flying Service Akron Ohio.

FOR SALE Three place biplane built in our shop OX-5 motor looks and performs like other new production flown but little account unsatisfactory landing fields here. A fine job must be seen and flown to be appreciated. Will sacrifice must sell. Ball Foundry and Machine Works Jacksonville Texas.

FOR SALE Siemens 120 hp. Waco ten in first class condition. Am offering this licensed plane at the low price of $3,500 for quick sale. Neil B Bonnrau Excelsior Minn.

FOR SALE Travel Air Monoplane N A type J5 motor only one hundred fifty nine hours. Perfect condition. Will sell or trade ship complete or without motor. Consider good three place late model ship. E T Barber Iola Kansas.

FOR SALE Motors OX-5 OXX-6 K-6 C-6 V-2 Hall Scott A7A. Write for complete price list. Airplanes Motors Parts. Southern Airplane Supply Company 210 E Vine St Knoxville, Tenn.

FOR SALE Waco 10 OX-5 motor and ship used very little. Fly away $2,000.00. Ellis Firth Inc Box 31 Bedford Indiana.

FOR SALE two genuine Wright E. One 80 Hissos in good condition. One with Hamilton high speed prop and hub $650. One with new Curtiss Reed prop $750. Scintilla Boosters with each motor. Finkles Bros Leland Miss.

FORTUNE in airplane sales. Under this plan a salesman should sell at least one Eaglerock a month—a net monthly income for him of from $1,000 to $1,500. Our two weeks' free sales training course makes you ready to get the money. We equip salesmen who qualify with a free demonstrator Eaglerock. You can offer buyers an easy plan of time purchase. Write for details. Alexander Aircraft Co. Dept. 11 Colorado Springs, Colo.

FOR SALE

PITCAIRN Orowing license number NC 979 OXX 6 motor with two Scintilla magnetos Drawing license number 7 077 OX-5 high compression motor Orowing number 2909 All priced for quick sale Tel 4302 Miller Corp. New Brunswick Airport New Brunswick N J

RYAN Brougham First reasonable offer for a quick sale will be accepted. J-5 motor 102 hours, brakes, turn and bank clock climb indicator heater compass, inertia starter etc Relicensed Ship always kept in hangar Motor and ship absolutely guaranteed Used by owner only for pleasure hops. Motor checked and oil changed every 12 hours 438 Pratt St Buffalo N Y

STINSON Junior new type Warner motor ship performing wonderfully Shows no signs of wear Taylor Aero Corporation 179 Moore Avenue Salt Lake City Utah

OX5 STANDARD new year ago and kept in hangar nose radiator DH undercarriage linen covering walnut propeller Motor perfect $870 M R Bilstrom Callender Iowa.

SWALLOW in perfect condition Will sacrifice to quick buyer or will exchange for cabin cruiser Baxter, 4234 Broadway Wash. Heights 3139

TWO OX-5 Waco 9s both just reconditioned and have been in storage the last year $1 000 each Harold W. Holley 1325 Carpenter Ave., Des Moines Ia.

WACO BARGAINS—For quick sale $1 700 $1 800 and $2 000 Two OX-5 motors, turn 1 100 on ground. $400 and $500 New York Aircraft Distributors, Inc Roosevelt Field Long Island, N Y

WACO 10 powered with 125 Siemens engine, never crashed two hours since motor completely rebuilt at factory Ship flown less than 150 hours Private used and always kept in hangar Price $4 000.00 A S K 3900 Delaware Ave S E., Minneapolis Minn

TRADE

TRADE Hisso-Standard recent overhaul new magnetos dual booster DH gears Want licensed Waco Ten or Travelair Cash difference T 183 Aviation 920 No Michigan Ave Chicago Ill

EQUIPMENT WANTED

TO buy or trade ship work for Lincoln-Paige parts anything considered Must act at once Coble Brothers, Aircraft Dept Monroe N. C.

WANTED—Aircraft motors and parts unfit for flight, for use in ground school any condition of motor will be of use No returns wanted Send details and price to M J Buthes 871 Seventh Street, Buffalo, N Y

WANTED A sport plane, one or two seater must be very good shape and reasonable Frank Murphy Peppas Meadville Pa

WANTED—To purchase one standard steel propeller hub complete for J-5 Whirlwind motor Westchester Airport Corp Armonk, New York

WANTED Late OX-5 Travel Air, Waco or Monocoupe for cash Harrison Motor Co Crossville Tenn

WANTED—Wings two lowers and left upper less aileron for Standard J1 covered or uncovered state price crated for immediate delivery Labette County High School, Altamont Kansas

POSITIONS VACANT

LICENSED and unlicensed airplane and engine field mechanics Permanent positions Opportunity for advancement Airport near New York City State full experience ability and salary expected P 190 Aviation Tenth Ave at 36th St New York

TRANSPORT pilot 2 000 hours or over Permanent position Splendid opportunity for advancement Airport near New York City Also pilot who can fill requirements of operations manager and general field manager State full aeronautical history and salary expected first year P 197 Aviation Tenth Ave at 36th St New York

POSITIONS VACANT

WANTED Transport pilot as instructor Reference required as to character and ability P 169 Aviation 920 No Michigan Ave., Chicago Ill

WANTED First-class aerial photographer to take charge of darkroom employing average ten men Must be experienced in making ratio prints big copy negatives and big enlargements to scale. Good position for right man Write giving full particulars and references P 191 Aviation Tenth Ave at 36th St., New York

WANTED Mechanics airplane and motor—one as instructor in mechanics school one in service department Must be steady reliable Drifters need not apply Good chance for advancement. Robbins Flying Service Akron, O

POSITIONS WANTED

AERONAUTICAL manager capable assuming complete charge or handle all branches mechanical aeronautical instructions thoroughly experienced capable and reliable S C White 330 Gates Ave., Brooklyn, N Y

ENGINEERING staff now building successful plane desires to make a change PW 183 Aviation 920 No Michigan Ave Chicago Ill.

LAFAYETTE Escadrille pilot Has 5 licenses including transport 3 000 hours, 50 types Blériot to Fokker 7 motors former instructor adviser Chinese Government chief engineer Carlstrom Field just completed aerial survey of Hawaiian Islands etc Wants to hear from proposition Go anywhere PW 188 Aviation 883 Mission St., San Francisco Calif

POSITIONS WANTED

LICENSED pilot desires position with some grad reliable company or private owner Best of references 65 hrs solo Four types L C license Fred L Bailey 217 W 8th St Kewanee Illinois

LICENSED pilot instructor in flying during war 1 000 hours flying time graduate of four year aeronautical engineering course, thoroughly conversant in all branches of aviation desires connection with active aeronautical concern PW 198 Aviation Tenth Ave at 36th St New York

LICENSED transport pilot available at once, 25 reliable one you can depend on Fred Angriudi 101 Windsor St., Reading Pa

YOUNG woman L C license 100 hours cross country some night flying sales experience pleasing personality wants to demonstrate planes for reliable company PW 187 Aviation 520 No Michigan Ave., Chicago Ill

(Continued on page 58)

WANTED

Experienced Aeronautical Engineers

competent to do structures or design work; permanent positions for capable men in old established company.

Write Box 454 Bayard
60 Spring Street, New York City

An Excellent Opportunity

for aeronautical engineers and draftsmen to get in on the ground floor of an aircraft company that believes in the future of aviation The company has sound financial backing and is in no sense promoting a stock selling scheme If you are interested in affiliating with a company that believes in a high standard of quality wire or write for further particulars thoroughly outlining your qualifications and position desired Aerodynamics structural materials specifications weights project and design engineers also layout and detail draftsmen desired

Rex B. Beisel, *Chief Engineer*,
SPARTAN AIRCRAFT CO
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To Employers Who Advertise for Men:

The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered

When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. Others do not receive the slightest indication that their letters have even been received, much less given any consideration These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bona fide

We can guarantee that Every *Advertisement Printed in the Searchlight Section Is Duly Authorized* Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked, say, "Position filled thank you." If you don't care to reveal your identity, mail them in plain envelopes

We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements

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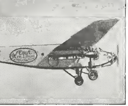
McGRAW-HILL PUBLISHING COMPANY, INC
"Put Yourself in the Place of the Other Fellow"

USED FORD TRI-MOTOR

J-4 Motors Newly Overhauled



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FOR SALE—$19,500

On account of larger and higher-powered equipment being required on our scheduled airlines, this ship is offered at an attractive price for immediate sale

Having had conservative handling by experienced pilots only and the best of care by licensed mechanics this ship is a rare bargain at the price quoted It is equipped for passenger carrying and sightseeing trips, and will be sold subject to demonstration at the Ford Airport

If so desired it will be equipped with J-5 engines at slight additional cost

STOUT AIR SERVICES, Inc. P. O. Box 86, Dearborn, Mich.

Wright Whirlwind Five, 165 H.P. Engine

32 hours in air in Verville Air Coach under care of expert Wright mechanics We are standardizing on Whirlwind-Seven. Price $2200 f.o.b. Detroit

Verville Aircraft Co.
7424 Melville Ave., Detroit

Fairchild FC-2 Five Place Cabin Monoplane

Condition excellent J-5 220 hp motor had 150 hours cost $18,100 Will accept a reasonable offer

DENNISON AIRPORT
Atlantic Mass

Plywood 1/16" 2 ply mahogany 25c sq ft—sheet 48x20 $2 New Dope $1 50 gal Thinner $1 20 gal Pinked tape 3c yd Lord Needles 25c ea Ribcord $2 FLIGHTEX wing covers for Waco Air Eagle Eaglerock Challenger SH JN Canuck $16 ea OX5 motors fired for ships $365—Hisso Standard $275 OX5 Standard $500 Swallow OX5 Sport Tommy $750 Wires 19 c1899 Special Hendersen propellers $15 Everything for Aircraft. Wanted—Toothpick Propellers

OSTERGAARD AIRCRAFT,
4233 N. Narragansett Chicago

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Half Price
WE HAVE ONE
ANZANI

80 H.P. with approx. 35 hours; one 120 H.P. and one 80 H.P. brand new. These are the new type engines. Also have new Hartzell and Hamilton props for these engines. Have no use for the above and will dispose of at practically half price

WALLACE AIRCRAFT CO.
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FOR SALE

Stinson, Jr. Whirlwind 5 Engine. Waco Taper-wing. World's greatest performing airplane.

The above ships like new, will go fast.

Waco 10—OX5 motor reconditioned, recovered and painted. Lincoln-Page OX5 motor, better than a new one Rebuilt, recovered, repainted. You should see this one.

Write or wire for descriptions and prices

Chicago Aero Sales Corp.
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PAYS THE FREIGHT

Although my business has increased almost fourfold over last year I am still

AMBITIOUS

to have more customers Consequently I will pay the freight anywhere in United States on any purchases of the following motors during August

Brand new Liberty 12	$300 00
Brand new Hammondsport OX 5	850 00
Brand new Wright 300 hp.	350 00
Overhauled Hisso 180 hp	850 00
Government overhauled Hisso 180 hp	600 00
180 hp Hisso needing overhaul	330 00
Used Wright 300 hp	225 00
New 120 hp LeRhone	125 00

25% off catalogue price on all Hispano Model A parts Lots of Wright 300 hp. parts dirt cheap

KARL ORT, York, Pa.

POSITIONS WANTED

(Continued from page 56)

LIMITED commercial pilot 31 single, land and seaplanes, 180 hours good stunter and demonstrator airplane and engine mechanic's license ground school instructor in all subjects as required for transport license desires position in the Eastern States PW 185 Aviation Tenth Ave at 36th St New York

NEW production 3 cylinder Anzani with double magneto propeller hub and cowling $400 Heath Airplane Company Chicago Ill

TRANSPORT pilot 5 years experience 900 hours navy trained experience sales and instruction all types PW 192 Aviation 520 No Michigan Ave Chicago Ill.

SPARE TIME WORK WANTED

TRANSPORT pilot sober and reliable would like to make connections with a party requiring a pilot for Sundays and holidays Chicago home port STW 195 Aviation, 520 No Michigan Ave Chicago Ill

LICENSED pilot with sales experience desires position as flying salesman with concern dealing in aeronautical supplies, planes or motors PW 200 Aviation 520 N Michigan Ave Chicago Ill

Army and Transport Pilot

Desires connection either private or with aeronautical concern Flying since 1917 and have over 1020 hours Best of references

Box PW 186 Aviation
Tenth Ave at 36th St New York City

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Man with four years' experience in aviation—two years in general management of large transport and school company—is seeking connection as executive in either transport or manufacturing field Interested in making investment provided facts show real possibilities. Specially trained and equipped for organization and operation management Please give full details first letter

Address Room 1902
77 West Washington Street Chicago

BUSINESS OPPORTUNITIES

CAPITAL or backer for the development of the most scientifically designed safe and noiseless airplane Rises and descends vertically Forward speed from 1 to 180 m p h Low manufacturing cost Can be housed in a garage rises from the back yard Patent pending Geo Lehberger 25 Hillside Ave Union N J

TO connect with some one to help finance one of the best aeroplane rebuilding shops in the south. BO 178 Aviation, Tenth Ave at 36th St., New York.

Unusual Proposition

Will sell plane hangar hass equipment Denver's only airport on paved highway. Larger crowds account location assured 594 graduates who have written for instruction prices. Widely known $8000 cash will handle Wonderful opportunity form large stock company or handle individually Floyd Clymer Denver Colorado

MISCELLANEOUS

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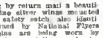

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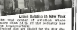

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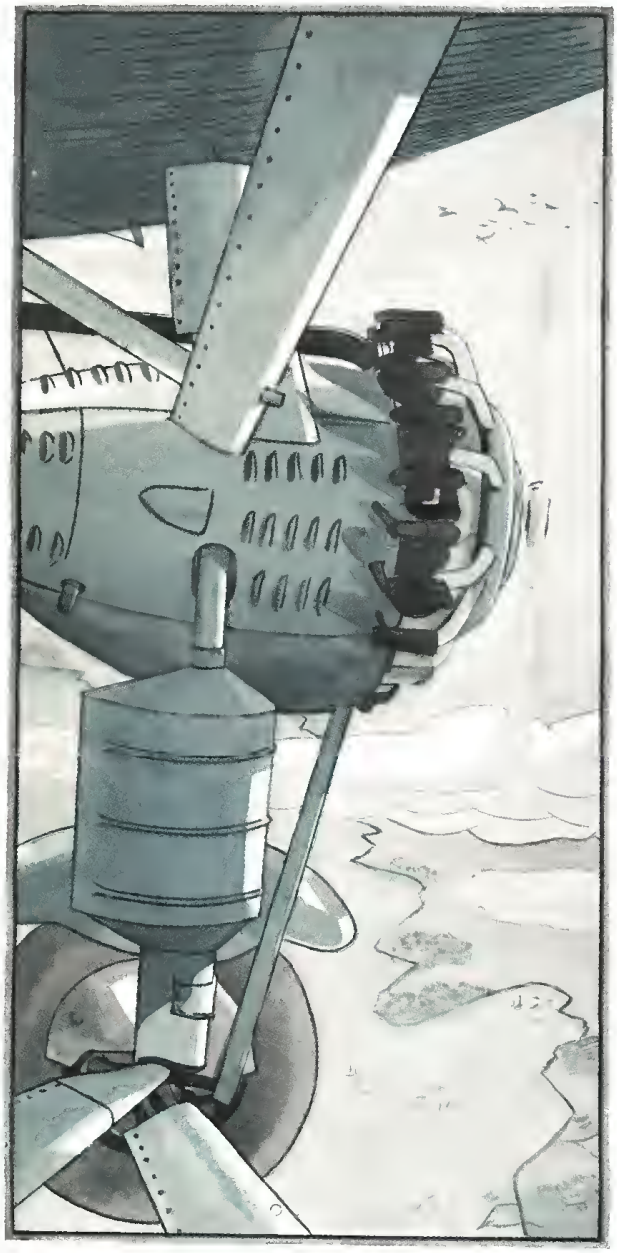

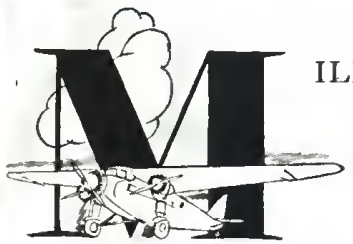

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